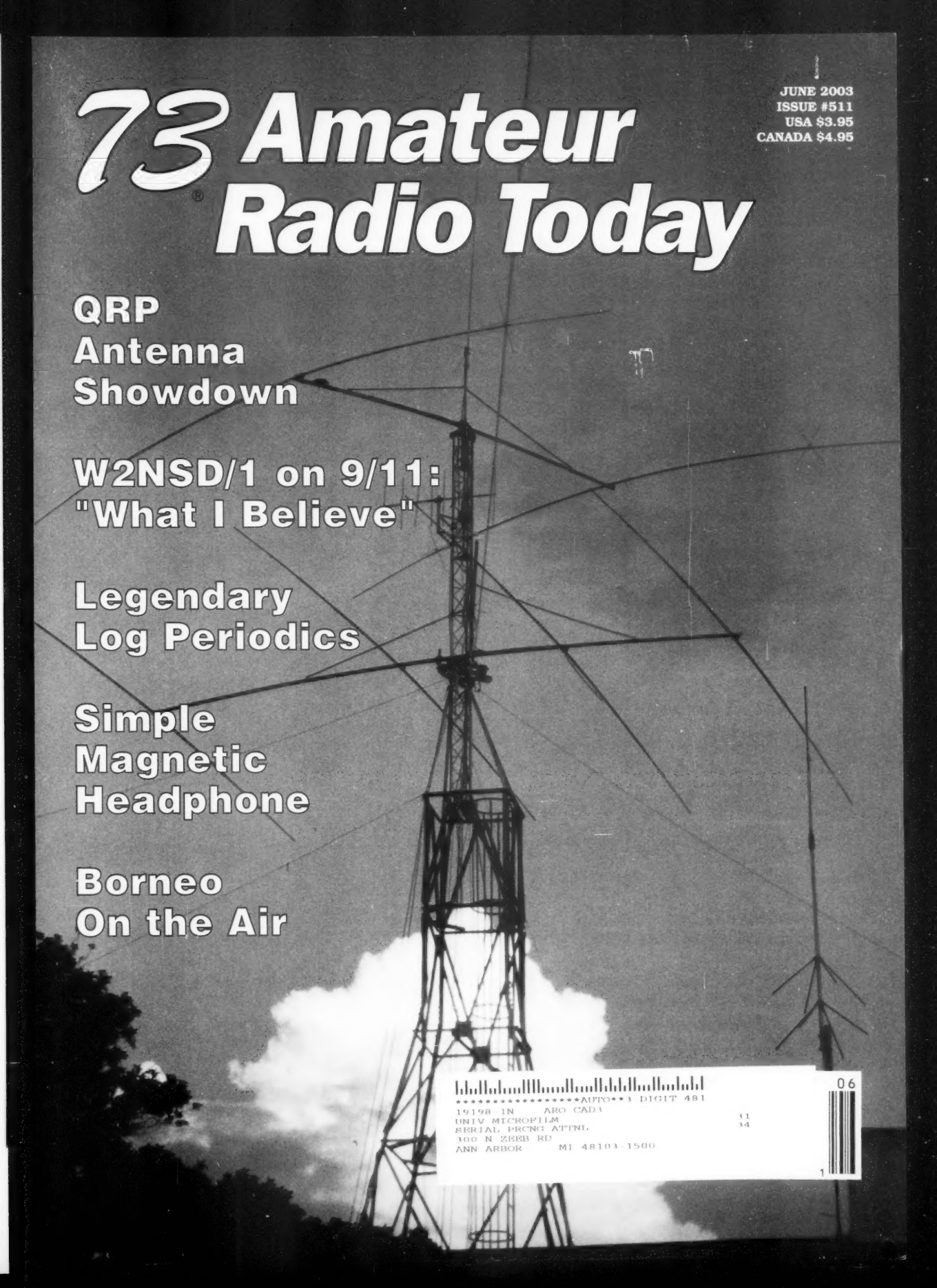


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# ALINCO Unleash The Power

New

## DR-620T VHF/UHF Dual-Band Mobile/Base

*First Amateur Twin Band Mobile To Support Optional Digital Voice Communications**

- *RX-VHF 108-173.995 MHz, UHF 335-480 MHz*
- *TX-VHF 144-147.995 MHz, UHF 430-449.995 MHz*
- *Receives Airband and Wide FM*
- *Front control unit separation (optional EDS-9 kit required)*
- *Advanced 10F3 digital mode with speech compression technology (EJ-47U required)**
- *200 memory channels*
- *Advanced EJ-50U TNC (optional) supports digi-peat mode*
- *Remote control features including parameter setting and direct frequency entry through the microphone*
- *Dual-Band receiver with V/U, V/V, U/U capability*
- *CTCSS/DCS encode/decode and European Tone-bursts*
- *OUTPUT: H/M/L-50/10/5 watts VHF*
- *OUTPUT: H/M/L-35/10/5 watts UHF*

## DR-605TQ VHF/UHF Dual-Band Mobile/Base

*Full 2 Meter/440 Performance*

- *100 memory channels, + a "call" channel for each band*
- *CTCSS encoded+decoded and tone scan*
- *Cross-band repeat and full duplex capability*
- *9600 bps packet ready with dedicated terminals*
- *Internal duplexer - one easy antenna connection*
- *RX-VHF 136-173.995 MHz, UHF 420-449.994 MHz*
- *TX-VHF 144-147.995 MHz, UHF 430-449.994 MHz*
- *MARS capability (permit required)*
- *OUTPUT H/L - 50/5 watts VHF, 35/5 watts UHF*
- *Time-out timer (ideal for repeater and packet operation)*

## DJ-V5TH VHF/UHF Dual-Band FM Transceiver

*5 watts of output power, in a compact package.*

- *Alphanumeric Display, up to 6 characters*
- *TX-VHF 144-147.995 MHz, UHF 420-449.995 MHz*
- *200 memory channels plus two call channels*
- *Full VHF + UHF Amateur Band Coverage*
- *Receive Range, (76 - 999MHz) includes Wide FM capability*
- *Up to 5 watts output, 3 output settings*
- *CTCSS encode+decode DTMF squelch and European Tone bursts*
- *4 scan modes, 5 programmable scan banks*
- *MARS capability (permit required)*

IronHorse

*Ask your dealer about the full line of Iron Horse antennas & accessories!*

## DJ-596T VHF/UHF Dual-Band HT with Digital Voice Option*

*Loaded with features! The breakthrough design supports optional digital voice communications and you can easily switch the unit between analog and digital modes!*

- *Full 4.5 watts output VHF/4w UHF*
- *Powerful NiMH battery*
- *100 memories in any combination of VHF or UHF channels*
- *Direct frequency input from keypad*
- *Each memory capable of "odd split" operation.*
- *Alphanumeric channel labels*
- *CTCSS/DCS encode+decode plus tone bursts*
- *Full 2m and 440 band coverage*
- *Accepts 6 to 16 VDC direct input*
- *Illuminated Keys and display*
- *Wide and narrow FM modes*
- *10 autodial memories*
- *Theft alarm feature*
- *Optional EJ-40U Digital Voice Board!**
- *Programming/Clone software available*

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**Specifications subject to change without notice or obligation.** *Digital communications require at least two similarly equipped transceivers. Digital mode may not be legal in some countries. See FAQ on digital at www.alinco.com. Products intended for use by properly licensed operators. Permits required for MARS use. Specifictions subject to change without notice or obligation.

JUNE 2003
ISSUE #511

# 73 Amateur Radio Today

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603-924-0058
Fax: 603-924-8613

Reprints: $3 per article
Back issues: $5 each

Printed in the USA

**Manuscripts:** Contributions for possible publication are most welcome. We'll do the best we can to return anything you request, but we assume no responsibility for loss or damage. Payment for submitted articles will be made after publication. Please submit both a disk and a hard copy of your article [IBM (ok) or Mac (preferred) formats], carefully checked drawings and schematics, and the clearest, best focused and lighted photos you can manage. "How to write for 73" guidelines are available on request. US citizens, please include your Social Security number with submitted manuscripts so we can submit it to you know who.

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## QRX . . .

### WA6ITF: "Dear Friends, Listeners, (and *73* Readers) ..."

I'm Bill Pasternak WA6ITF, and since 1977, I have been the unpaid volunteer producer of what is today the *Amateur Radio Newsline*. You often read our material here in this QRX column. I am here for one reason. In just one word, money. Money to keep *Amateur Radio Newsline* in operation.

Simply stated, *Amateur Radio Newsline* is once again in deep financial trouble and we need an immediate infusion of funds to keep the service alive and the weekly newscasts coming your way.

Here's the score. As this is being written [April 14], our Support Fund Administrator, Andy Jarema N6TCQ, says that there is only $24.80 left in the Newsline Support Fund bank account. There are also outstanding bills totaling $661 sitting on his desk that must be paid immediately.

No extensions of time will be given to us. No delays will be entertained. These creditors — namely telecommunications providers — want to be paid right now. Otherwise, our ability to communicate goes away and the news gathering process grinds to a halt. It could happen before the next newscast gets to you a week from now.

Actually, you would not have heard this week's *Amateur Radio Newsline* report (#1339) if I had not

*Continued on page 6*

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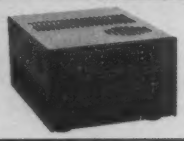

MODEL SS-10TK

MODEL SS-12IF

**SPECIAL FEATURES:**

- HIGH EFFICIENCY SWITCHING TECHNOLOGY SPECIFICALLY FILTERED FOR USE WITH COMMUNICATIONS EQUIPMENT, FOR ALL FREQUENCIES INCLUDING HF
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MODEL SS-18

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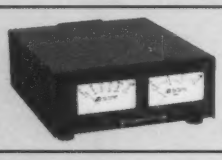
| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SS-10 | 7 | 10 | 1⅛ x 6 x 9 | 3.2 |
| SS-12 | 10 | 12 | 1⅛ x 6 x 9 | 3.4 |
| SS-18 | 15 | 18 | 1⅛ x 6 x 9 | 3.6 |
| SS-25 | 20 | 25 | 2⅞ x 7 x 9⅛ | 4.2 |
| SS-30 | 25 | 30 | 3¾ x 7 x 9⅛ | 5.0 |



MODEL SS-25M

**DESKTOP SWITCHING POWER SUPPLIES WITH VOLT AND AMP METERS**

| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SS-25M* | 20 | 25 | 2⅞ x 7 x 9⅛ | 4.2 |
| SS-30M* | 25 | 30 | 3¾ x 7 x 9⅛ | 5.0 |

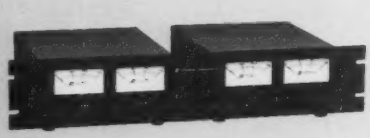
MODEL SRM-30

**RACKMOUNT SWITCHING POWER SUPPLIES**

| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SRM-25 | 20 | 25 | 3½ x 19 x 9⅛ | 6.5 |
| SRM-30 | 25 | 30 | 3½ x 19 x 9⅛ | 7.0 |

**WITH SEPARATE VOLT & AMP METERS**

| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SRM-25M | 20 | 25 | 3½ x 19 x 9⅛ | 6.5 |
| SRM-30M | 25 | 30 | 3½ x 19 x 9⅛ | 7.0 |



MODEL SRM-30M-2

**2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL**

| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SRM-25-2 | 20 | 25 | 3½ x 19 x 9⅛ | 10.5 |
| SRM-30-2 | 25 | 30 | 3½ x 19 x 9⅛ | 11.0 |

**WITH SEPARATE VOLT & AMP METERS**

| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SRM-25M-2 | 20 | 25 | 3½ x 19 x 9⅛ | 10.5 |
| SRM-30M-2 | 25 | 30 | 3½ x 19 x 9⅛ | 11.0 |

MODEL SS-12SM/GTX

MODEL SS-10EFJ-98

***CUSTOM POWER SUPPLIES FOR RADIOS BELOW***

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EF JOHNSON AVENGER GX-MC42
EF JOHNSON GT-ML81
EF JOHNSON GT-ML83
EF JOHNSON 9800 SERIES
GE MARC SERIES
GE MONOGRAM SERIES & MAXON SM-4000 SERIES
ICOM IC-F11020 & IC-F2020
KENWOOD TK760, 762, 840, 860, 940, 941
KENWOOD TK760H, 762H
MOTOROLA LOW POWER SM50, SM120, & GTX
MOTOROLA HIGH POWER SM50, SM120, & GTX
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
UNIDEN SMH1525, SMU4525
VERTEX — FTL-1011, FT-1011, FT-2011, FT-7011

***NEW SWITCHING MODELS***

SS-10GX, SS-12GX
SS-18GX
SS-12EFJ
SS-18EFJ
SS-10-EFJ-98, SS-12-EFJ-98, SS-18-EFJ-98
SS-12MC
SS-10MG, SS-12MG
SS-101F, SS-121F
SS-10TK
SS-12TK OR SS-18TK
SS-10SM/GTX
SS-10SM/GTX, SS-12SM/GTX, SS-18SM/GTX
SS-10RA
SS-12RA
SS-18RA
SS-10SMU, SS-12SMU, SS-18SMU
SS-10V, SS-12V, SS-18V

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**Trunk Lockout • Trunk Delay • Cloning Capability**
**10 Priority Channels • Programmed Service Search**
**Size: 2 1/2" Wide x 1 3/4" Deep x 6" High**
***Frequency Coverage:***
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Our Bearcat TrunkTracker BC245XLT is the world's first scanner designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS and EDACS® analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. Our scanner offers many new benefits such as Multi-Track - Track more than one trunking system at a time and scan conventional and trunked systems at the same time. 300 Channels - Program one frequency into each channel. 12 Bands, 10 Banks - Includes 12 bands, with aircraft and 800 MHz. 10 banks with 30 channels each are useful for storing similar frequencies to maintain faster scanning cycles or for storing all the frequencies of a trunked system. Smart Scanner - Automatically program your BC245XLT with all the frequencies and trunking talk groups for your local area by accessing the Bearcat national database with your PC. If you do not have a PC simply use an external modem. Turbo Search - Increases the search speed to 300 steps per second when monitoring frequency bands with 5 KHz. steps. 10 Priority Channels - You can assign one priority channel in each bank. Assigning a priority channel allows you to keep track of activity on your most important channels while monitoring other channels for transmissions. Preprogrammed Service (SVC) Search - Allows you to toggle through preprogrammed police, fire/emergency, railroad, aircraft, marine, and weather frequencies. Unique Data Skip - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. Memory Backup - If the battery completely discharges or if power is disconnected, the frequencies programmed in your scanner are retained in memory. Manual Channel Access - Go directly to any channel. LCD Back Light - An LCD light remains on for 15 seconds when the back light key is pressed. Autolight - Automatically turns the backlight on when your scanner stops on a transmission. Battery Save - In manual mode, the BC245XLT automatically reduces its power requirements to extend the battery's charge. Attenuator - Reduces the signal strength to help prevent signal overload. The BC245XLT also works as a conventional scanner. Now it's easy to continuously monitor many radio conversations even though the message is switching frequencies. The BC245XLT comes with AC adapter, one rechargeable long life ni-cad battery pack, belt clip, flexible rubber antenna, earphone, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, ESAS or LTR systems.

Hear more action on your radio scanner today. Order on-line at www.usascan.com for quick delivery. For maximum scanning satisfaction, control your Bearcat 245XLT from your computer running Windows. Order Scancat Gold for Windows, part number **SGFW** for $99.95 or the surveillance enhanced version with audio recording part number **SGFWSE** for $159.95.

## More Radio Products

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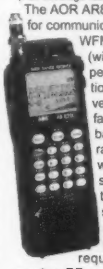
| Bearcat 785D 1,000 channel Trunktracker III base/mobile | $339.95 |
| Bearcat BCi25D APCO Project 25 digital software card | $299.95 |
| Bearcat 278CLT 100 ch. AM/FM/SAME WX alert scanner | $139.95 |
| Bearcat 250D 1,000 ch. Trunktracker III handheld scanner | $339.95 |
| Bearcat 245XLT 300 ch. Trunktracker II handheld scanner | $189.95 |
| Bearcat 248CLT 50 ch. base AM/FM/weather alert scanner | $84.95 |
| Bearcat Sportcat 200 alpha handheld sports scanner | $159.95 |
| Bearcat Sportcat 180B handheld sports scanner | $139.95 |
| Bearcat 80XLT 50 channel handheld scanner | $99.95 |
| Bearcat 60XLT 30 channel handheld scanner | $74.95 |
| Bearcat BCT7 information mobile scanner | $139.95 |
| AOR AR16BQ Wide Band scanner with quick charger | $199.95 |
| Sangean ATS909 306 memory shortwave receiver | $209.95 |
| Sangean ATS818 45 memory shortwave receiver | $139.95 |
| Uniden WX500 Weather Alert with S.A.M.E. feature | $39.95 |

## AOR®

### AOR® AR8200 Mark IIB Radio Scanner

AOR8200 Mark IIB-A wideband handheld scanner/**SPECIAL $539.95**
**1,000 Channels • 20 banks • 50 Select Scan Channels**
**PASS channels: 50 per search bank + 50 for VFO search**
**Frequency step programmable in multiples of 50 Hz.**
**Size: 2 1/2" Wide x 1 3/8" Deep x 6 1/8" High**
***Frequency Coverage:***
500 KHz to 823.995 MHz, 849.0125-868.995 MHz, 894.0125-2,040.000 MHz
(Full coverage receivers available for export and FCC approved users.)



The AOR AR8200 Mark IIB is the ideal handheld radio scanner for communications professionals. It features all mode receive: WFM, NFM, SFM (Super Narrow FM), WAM, AM, NAM (wide, standard, narrow AM), USB, LSB & CW. Super narrow FM plus Wide and Narrow AM in addition to the standard modes. The AR8200 also has a versatile multifunctional band scope with save trace facility, twin frequency readout with bar signal meter, battery save feature with battery low legend, separate controls for volume and squelch, arrow four way side rocker with separate main tuning dial, user selectable keypad beep/illumination and LCD contrast, write protect and keypad lock, programmable scan and search including LINK, FREE, DELAY, AUDIO, LEVEL, MODE, computer socket fitted for control, clone and record, Flash-ROM no battery required memory, true carrier reinsertion in SSB modes, RF preselection of mid VHF bands, Detachable MW bar aerial. Tuning steps are programmable in multiples of 50 Hz in all modes, 8.33 KHz airband step correctly supported, Step-adjust, frequency offset, AFC, Noise limited & attenuator, Wide and Narrow AM in addition to the standard modes. For maximum scanning pleasure, you can add one of the following optional slot cards to this scanner: **CT8200** CTCSS squelch & search decoder $89.95; **EM8200** External 4,000 channel backup memory, 160 search banks. $69.95; **RU8200** about 20 seconds chip based recording and playback $69.95; **TE8200** 256 step tone eliminator $59.95. In addition, two leads are available for use with the option socket. **CC8200A** personal computer control lead $109.95; **CR8200** tape recording lead $59.95. Includes 4 1,000 mAh AA ni-cad batteries, charger, cigarette lighter adapter, whip aerial, MW bar antenna, belt hook, strap and one year limited AOR warranty. For fastest delivery, enter your order on-line at http://www.usascan.com.

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Price schedule effective December 2, 2002 AD #120202 © 2002 Communications Electronics Inc.

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# Wise Up & Beat the Odds

## NEVER SAY DIE

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**Planet X**

Several readers have called, asking if I believe that Planet X is real. No, of course not.

Sure, Mark Hazelwood, in his book *Blindsided,* made a strong case for it coming along in May this year and almost extincting humanity.

Well, scientists agree that something has happened in the past that suddenly shifted the poles, causing enormous worldwide destruction. And we know that something is causing the Sun to act up like we've never seen it before. And that something is causing an increase in earthquakes and newly erupting volcanoes. And that the weather lately has been far beyond weird. And that something has caused Pluto and Mars to heat up.

Then there's the disturbing unanimity of soon-to-come pole shift predictions by Nostradamus, Edgar Cayce, Jim McCanney, Charles Hapgood, and a bunch of other prophets with good records.

I wonder what the people who co-existed with those Siberian woolly mammoths that were flash-frozen with tropical flowers in their mouths thought the day before the last time the poles suddenly shifted?

Does Planet X come along every 3,630 years and on some passes shift the poles, wiping the slate clean as a bonus?

No, I don't believe Planet X is real, no matter what Zacharia Sitchin has found in the ancient records, or all those prophets say. But, I'll sure breathe a lot easier if we're all still around this summer sweating out how Bush's domestication of Iraq is going.

**Webbing It**

More and more amateurs are integrating their operating with the Internet. There are things that are easier on the Web, and things we can do better on the ham bands ... so why not combine them for the betterment of both hobbies?

For instance, I was just reading in an ATV newsletter that more and more ATV repeaters are being interfaced with the Web, allowing hams just about anywhere in the world to swap videos over local ATV repeaters. That's great!

W7DXX, a couple years ago, set up his station so it could be operated remotely over the Web. The first user was a ham in Hong Kong.

When I visited Art Bell W6OBB in Pahrump NV recently, Art's wife Ramona took a digital picture of Art and me which Art then sent to the group on 3840 via slow scan. He also sent a copy to me by E-mail, and the whole deal from taking the picture to delivering it over the air and via the Web took about two minutes.

Fun? You bet. So let's get more hams having fun like this. And that means I want to start seeing ham/Web articles being submitted. I want to know how to interface my rig to the Web. What software do I need and where can I get it? How can I start swapping videos via my eMac via the Web over ATV repeaters? How about connections to voice repeaters around the country? Heck, around the world? And bring the readers up-to-date on high definition color digital pictures via slow scan.

Let's make *73* the magazine to look to for Internet/ham interfacing and operating. If you've been participating in this mischief, tell us about it. Let's get the readers excited and busy upgrading their stations.

**What I Believe**

The conspiracy buffs are having a field day with those ex-towers ... and I don't believe them for a minute. I believe the government. Never mind that the government lied to us about the Oklahoma City bombing. And about Flight 800 being downed by a missile. And about the Roswell UFO crash. And about Area 51 not existing. And about Amelia Earhart being lost at sea. And ... and ... and, etc.

I don't believe there was a 1200% increase in short orders on American and United Airlines stocks in the week before 9/11, even though this was reported by the Chicago Securities Exchange, and that there has been no official investigation.

I don't believe that two of the terrorists went to a topless bar a few nights before 9/11, spent over $200 each for lap dances, and left their business cards and a copy of the Koran behind. Fundamental Muslims don't drink ... it's against Islamic law.

I don't believe that a group of Israelis, here without permits, were caught filming and cheering from the top of a building in Jersey City, New Jersey, as the Towers were being attacked — and then were allowed to return to Israel.

I don't believe that Secretary of State Madeline Albright (Clinton's appointment) turned down the offers of both Yemen and Sudan to extradite Osama bin Laden.

I believe that even though six of the eight pilots on the four flights had military backgrounds, that they were overwhelmed and killed by hijackers armed only with box cutters without being able to send out any alarm.

I don't believe that experienced pilots claim that the maneuvers the planes made to hit the towers would be virtually impossible for any but the most advanced pilots.

I believe that the information in all of the black boxes was destroyed, as the FAA claims.

I don't believe that Flight 93, which crashed in Pennsylvania, was shot down ... that the debris was scattered over an eight mile radius, that the largest piece was the size of a telephone book, and that residents of the area heard a loud explosion and saw a military jet.

I do believe that the terrorists permitted the passengers to make phone calls from the plane to their families.

I do not find it strange that though the FAA knew Flights 11 and 175 had been hijacked, that when an F-16 was finally scrambled, that it was ordered

to proceed at a conventional speed, even though the pilot requested permission to go full speed ahead. Or that Flight 77 was in the air for 43 minutes after the FAA knew it had been hijacked and was headed for Washington DC, and yet no fighters were scrambled … even from Andrews Air Force Base, minutes away.

I do not find it strange that the steel in the towers melted, even though steel melts at 2700° and jet fuel burns at 1800° at the highest … and that much of the jet fuel burned outside the building.

I don't find it strange that the FBI was able to come up with the names and pictures of the hijackers within days of the attack.

Nor odd that the FBI found Mohammed Atta's bag, which somehow didn't make it on the plane, and it was loaded with incriminating evidence. But I do wonder why a terrorist bound on a suicide mission would check a bag for the flight.

And how about the amazing coincidence of a hijacker's passport surviving the crash into the tower and the ensuing fire, to be found by the police in the street unharmed? I love coincidences like that.

Yes, of course I believe the official casualty numbers. Why would they lie? But I wonder how thousands upon thousands of people were able to get down the three usable narrow single-lane stairwells in the panic, and do it in the few minutes between the planes crashing into the towers and their collapsing. And this while the firemen, with their equipment, were trying to go up the same narrow stairwells. A miracle!

And I marvel at how considerate the hijackers were of the Jews, whom they hate even more than the rest of us, yet they struck the buildings on Yom Kippur, a Jewish holiday, assuring that few Jews would be in the buildings that day. The choice of a major Jewish holy day could hardly have been a coincidence, since the attack had to have been planned far in advance. It's kinda like the coincidence with the Murrah building bombing in Oklahoma City, when the FBI staff didn't come in to work that day. Think of the odds!

**A Plan**

Forty years ago, back when I started *73*, when I went to an IEEE show, most of the top people I met in the electronic industry were hams. Same thing at the military electronics shows. Why? That's simple — because, according to an ARRL study at that time, 80% of our ham newcomers were teenagers and 80% of those went on to high-tech careers.

Today's teenagers have never heard of ham radio. Where would they hear about it? When is the last time you saw an article in the paper about our hobby? Or anything on television? Or heard about it on the radio? Or in a magazine article? We've become invisible unless a kid's grandfather happens to be a ham.

Our electronic industries are having to import their technicians from India, China, and other countries because we have so few Americans available. Less than half of our university engineering graduates are Americans.

So, what can we do about it? What can you do about it?

Two things.

First, we have to make ham radio visible to teenagers. We have to let them know the hobby exists.

Second, if we're going to get kids into ham radio, we have to get them excited about it. And that's where you can help right now.

Has ham radio ever provided you with any adventure or excitement? Okay, get busy and tell the story. Write about it and send it to me. I'll put your story on the Web, where teenagers will be able to read it and find out how much fun they've been missing.

That's the first part of the solution — now, how do we get the visibility it takes to get kids to the Web site? How do we get the buzz started? The easiest way is the most fun way — by talking. That's something we presumably are good at. But I mean on talk radio shows, not on the ham bands.

Almost every radio station has a talk show, and they're really hurting for interesting guests. There are thousands of talk shows and they all need new guests every day.

Okay, here's the drill. First call every radio station in your phone books and ask about their talk shows. Get the name of the shows' producers. Next, send a short letter to the producers explaining why you'll make a good guest. Pose a question, and then answer it. "How can we interest teenagers in high-tech careers — where the big money is? By getting them interested in an exciting high-tech hobby like amateur radio."

Then briefly explain the excitement and adventure hamming has provided you and add a short bio.

Give the host some sample questions: How expensive is the hobby? How can a youngster get started? How difficult it is to get a license?

Be persistent. Never Say Die.

It's that easy.

There's nothing wrong with amateur radio today that a few million teenagers entering the hobby won't fix.

Yes, of course I'll publish an inexpensive book with reprints of the most interesting stories I get. That'll be for the few teenagers who have learned to read.

**The Ramsey Catalog**

Wow! 48 pages of kits and gadgets that really got my juices going. All kinds of QRP stuff, test equipment, AM and FM broadcast transmitters, an ion generator, a Van de Graff generator, laser-beam communicators, lots of security stuff, underwater video camera systems, all kinds of antennas … it goes on and on. Give 'em a call and get your copy … 505-924-4560. Now, what did I do with my old workbench?

**Am I Blue?**

The drug industry is getting concerned over the word getting out about silver colloid being a better antibiotic than anything they're selling. It seems to be the only antibiotic that germs can't compromise and it's unpatentable, so no wonder the concern.

Their poster woman managed to turn blue as a result of too much silver. From silver colloid? No, from nose drops. I'm lucky I didn't do the same. Not long after my first childhood vaccinations I got serious ear infections and then a sinus infection that lasted for over three years. My mother tried to clear my sinuses first with ephedrin drops and then, for over a year, with Neosilvol. Nothing worked. I was unable to breathe through my nose for even an hour all those years. It's amazing that I didn't turn blue from all that silver.

Yes, I believe it's possible to turn your skin gray or blue if you drink enough silver colloid, but I'll bet we're talking 500 ppm, not 10 or 20 ppm, which is what I recommend people take.

I don't see any big benefit in drinking the stuff on a regular basis, but I've had many people call who have been drinking a few teaspoons of it every day for years … and still can't pass for ETs. I keep some on hand in a brown bottle and take some if I feel like something might possibly be coming on.

The stuff is so easy to make that it's pathetic. I've been busy filling orders for my silver colloid kit (#82 in my catalog). It consists of two 5-inch lengths of #10 (heavy-duty) silver wire, a small power supply that plugs into the wall, an instruction sheet, and a reprint of an article on making and using silver colloid. The whole works, by priority mail, sells for $37… one of the better bargains out there.

You open the box, put the wires in a glass of distilled water along with about two

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*continued from page 1*

made partial payment on some of these bills out of my own pocket. But candidly, that's it. I just do not have the money to keep *Amateur Radio Newsline going all by myself.*

For those of you who do not understand where the money is spent, let me lay it out for you. The biggest single cost is worldwide long distance telephone service. For example, I just got off the phone after talking to a ham in Kuwait City who had news of possible resumption of Amateur Radio in Iraq by broadcast engineers assigned to news bureaus. Calls like this are how we get most of the news that we deliver to you.

Even with the discounts we have negotiated through long-term contracts, a 12-minute call like this does not come cheap. But it is the price we pay so that we can bring you the most accurate and up-to-date news regarding amateur radio operations worldwide.

Currently, it costs *Amateur Radio Newsline* an average of $500 to $600 a month in long distance fees. And this is in addition to the cost of normal local phone service and any domestic long distance — the latter also negotiated at deep discount rates. Summing it up, the telephones total close to $800 a month. Sometimes a bit more. Sometimes a bit less. But $800 is a solid average these days.

But that's not all. There is also the cost of high speed Internet access, Web site hosting, file transfer space (FTP site), and everything else that comes with maintaining an interactive home in cyberspace. That's the home that we must retain to get the news out to you. It's called [http://www.arnewsline.org].

And there are still tape cassettes and portable recorders. Yes, we still use good old cheap audiocassettes and mostly Sony consumer recorders to gather the news. And we go through quite a few tapes every month and a recorder or two a year. Even at the wholesale prices we pay, it's still an average of $20 to $30 for what we use.

That's assuming that nothing goes wrong, of course. That nothing breaks. Or that on-line protocols do not change, and necessitate expensive software upgrades. So you see, the total cost of bringing you the news is over $1,000 a month, or about $250 a week.

Some of you will say that this is an awful lot of money, so here is a point of comparison. As some of you know, I work in the broadcast industry. As such, I can tell you that amortized across the business day, it costs the "average" local television station around $1,000 to $1,500 per hour — depending on the market — just to cover a single story that may run 30 seconds on a newscast. If they fly a news helicopter, you can add another $700 an hour.

And that's local news! International news coverage costs a lot more than that. When you compare our rather meager budget with the news department of an "all news" local radio station, it's easy to see that *Amateur Radio Newsline* has learned to squeeze a nickel so hard that it yells "Uncle!"

The reason we can do this is because there is no paid staff. Everyone — this writer included — and the corporation's Board of Directors — is a volunteer. We have no salaries to pay and none of the peripheral expenses that come with maintaining a full-time group of employees.

But, what if something does go wrong? What if a fax machine or cassette recorder breaks and needs to be replaced? Or a computer dies and needs to be repaired? Or we are faced with a mandatory software upgrade because providers no longer support the software that worked just fine three days ago?

Well, it works this way. If it's a "must do," I pay for it out of my own pocket and hope that donations will cover it at some later date. That's the way that it has been since 1977, when I took over the then Westlink News Service from Jim Hendershot WA6VQP. And believe it or not — that's the way it is, to this day!

If anyone else on our all-volunteer staff has a problem, they fix it and submit a bill. If there is money in the account, they get reimbursed. No money, and they wait. No bill submitted — no repayment.

And — oh, yes. There is the $1,100 or so that it will cost us this August to present the Young Ham of the Year Award. Yes, Vertex-Standard and *CQ Magazine* cover all the expenses of the youngster chosen to receive the award, but we have to pay to send a representative to Huntsville, Alabama, to present the award and also — this is a biggie — cover the costs of the mini-banquet to honor the youngster the committee has selected. (The Huntsville Hamfest, like most amateur radio shows, discontinued its annual banquet several years ago.)

I was just over on ORBITZ.com, the airline travel site. I plugged in Burbank, California — the airport closest to us — and Huntsville, Alabama, as the destination. This year's fare for this summer — the 21-day, discounted purchase price, is $543. And that's if we buy it now — before prices go up in early May. And we would — if we had the money to do it!

Here's the bottom line. I am a working stiff just like the rest of you. So are all of those who volunteer their time and talent to producing these weekly newscasts. I can personally help out with finances in a real pinch, but I am not made of money and cannot keep shelling out what it costs to keep the *Amateur Radio Newsline* newscasts coming your way. The money just isn't there!

If you want *Amateur Radio Newsline* to continue, you will have to vote "yes" with your checkbook, and you have got to do it right now! Today! Not next week or next month. Today is it!

Again, this is the bottom line: If we do not raise the $661 immediately, and an additional $1,000 a month — every month — month after month after month — we will be gone and we will not be back.

Remember, *Amateur Radio Newsline* is a federal, 501 (c)(3) non-profit corporation. Your contributions are tax-deductible. So we end this far-too-long announcement with the address for the Newsline Support Fund, PO Box 660937, Arcadia CA 91066.

**OR ... Look us up if you are at Dayton ... We'll be happy to give you a receipt, hi.**

We hope that you will respond and that this week — or next week — will not be the last week we bring you the news. Let's hope that it can, and will, continue to be with you for weeks, months, and years to come. Either way, it has been a great 26-year-run — and we thank you for supporting us over the years.

**Bill Pasternak WA6ITF**
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## Space and Science: SETI@home

The SETI@home screensaver that crunches data in search of intelligent signals from space has produced a list of candidate radio sources that deserve a second look. Scientists behind the project will use a giant radio telescope to take a second look based on this data.

SETI@home is more than the usual screensaver. It's actually a very high-tech data processing program disguised as a screensaver. It springs into action after a computer is idle for a given length of time. Its purpose is to analyze radio telescope data downloaded to the machine over the Internet, search for strong or unusual signals from space, and file a report back.

Many hams worldwide have embraced SETI@home and have it running around the clock on their PCs. They are the first to tell you that the project is in keeping with the spirit of amateur radio itself. What is important is that SETI@home has performed the most sensitive and detailed SETI sky survey to date, has demonstrated the power of the Internet for doing scientific distributed computing, and has allowed the general public to participate directly in exciting research.

So far, 4,287,000-plus users have lent their spare computing time to analyze radio data for the SETI@home team. You can become a part of the project by taking your Web browser over to http://setiathome.ssl.berkeley.edu.

*Thanks to W6RCL, and K2SSQ, via Newsline, Bill Pasternak WA6ITF, editor.*

## NEVER SAY DIE

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grains of salt to make it conductive, clip the two power supply wires on the wires (yes, the power supply wires come with alligator clips attached … nothing to solder), wait about 20 minutes, and you've got 10 ppm silver colloid solution for about two cents a gallon.

The stuff is recommended by many experts for any rash, wart, infection, athlete's foot, jock itch, psoriasis, and so on. It's also perfect for rinsing any food that might have germs … like E. coli and salmonella on chicken, or anything on fruit or vegetables that may have come from some other country.

**Service**

One thing that makes it so difficult to learn English is that so many of our words can have several meanings. Like the word "service." It can mean doing things for people, like (sort of) the Postal Service. Then there's Internal Revenue Service, which brings to mind the term used by farmers of having their cows serviced by a bull.

**French Fry Alert**

The next time they ask, "Do you want fries with that?", the answer is NO!

Outside of the fact that all cooked food is considered toxic by our immune systems and eventually will lead to stopping your body's engine via cancer, heart attack, or something else terminal … and therefore you shouldn't be ordering anything that will trigger such a question. And never mind any boycott of anything French. Hey, does that also include French vanilla ice cream? Oh, what we have to give up to be politically correct!

Anyway, this screedlet has to do Acrylamide, a very toxic chemical used in manufacturing plastic. This stuff has long been known to help cause malignant cancer, severe nerve damage, and DNA mutation which can carry on to one's children.

Last year, for some reason, the Center for Science in the Public Interest ran tests which showed that the amount of Acrylamide in a large order of fast-food fries was at least 300 times more than the EPA allows in a glass of water.

So where did it come from? Further research showed that when any food is fried, especially deep fried, and particularly starchy foods like potatoes, Acrylamide is produced. Hmm, starchy … like maybe doughnuts?

No wonder our police are edgy … on a diet of coffee and doughnuts. As I've mentioned before, coffee is a mind-altering stimulant that produces a surge of nervous energy … and then leaves you exhausted, depressed, irritable and short tempered. Caffeine stimulates the brain cortex, causing poor memory, poor balance, fatigue, anxiety, hand tremors, hostility, headaches and dehydration. Researchers claim that it takes two or three cups of water to overcome the dehydration caused by one cup of coffee.

And sugar? Wait'll you read Nancy Appleton's *Lick The Sugar Habit.* Sugar is infamous for causing arthritis and boosting your cancer probability.

Any fried food includes those delicious chicken wings and KFC agenda.

Most authorities agree that the huge increase in cancer has been caused by our diet change over the last hundred years.

What percentage raw food have you achieved so far in your diet? You know, like apples, bananas, oranges?

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# LETTERS

## From the Ham Shack

**R.A. Appleyard VE3YAG.** Wayne, this letter will warm your kit and homebrewing heart. My six-year-old son wants to build something for his mother, so I have ordered a catalog from Ramsey Electronics, and I mentioned your superb, well-written magazine too, and Ramsey is forwarding one to me. If my six-year-old is ambitious to build a kit, what is wrong with the rest of us hams?

Wayne, after I assist in building the kit, it will be entered into the VE3DC Hamilton Amateur Radio Club Crawford Trophy homebrew competition. The challenge is, Let's not have a six-year-old show us up.

My daughter, 12, for about the last 10 years has wanted to be a physician, and that has been her focus in life — plus, she wants to be a ham.

One comment, Wayne — Incentive Licensing keeps many hams from using many frequencies that otherwise would be available, especially Novice and Tech. If 80/40 are down and 10 is mainly daytime, they have nowhere to go. Maybe a class system like Canada Basic and Advanced. Advanced here in Canada can run more power, operate repeaters and club stations, and build transmitters. Basically, Wayne, the caste system has to go, and all hams are on the same level of equal access to all frequencies, or one day we will lose all frequencies. Me, I am a Basic with 12 wpm endorsement and quite satisfied, and when I get time, I will obtain my Advanced.

Looking at the Icom band chart, all those hams with no privilege of operating there gives the commercial operators more leverage at auction time.

Finally, CC&R rules and regulations. Why use a sledgehammer to kill a fly? If an amateur is moving into a restricted area, why not produce sketches to show how the antenna would look, especially if you can blend it in with the landscape? Show them your shack. Inform the board that an antenna provides lightning protection. If you reside in tornado or hurricane alley, you can provide timely warning, and when disaster strikes you could be the only link to the outside. If there are serious injuries, it will be a life-or-death matter in response time, so let's stop running to Big Brother and solve our own problems.

Wayne, if you do have an acid tongue it is only because you have hit the nail right square on the head.

*Or something like that. Thanks. — Wayne.*

**Jack Sauers, Seattle WA.** Wayne, it was nice to receive your letter. Perhaps the northern expansion of the South Atlantic currents from Antarctica will be another aspect of the death of the Gulf Stream farther north. Maybe those Magellanic penguins know something Al Gore doesn't. Cold waters increase the plankton growth, and that increases the sardine and herring, and furnishes good munchies for the penguins, which headed 2,000 miles north, since the Antarctic Ocean is cooling during this La Niña, and pack ice has gone out to over 33 miles from the one mile during the last El Niño year of 1998.

A much slower process is the increase in mass balance of the 25,000,000-square-mile Antarctic Ice Sheet, which is going up, from satellite altimetry at 0.2 meters, or 8 inches a year, increasing by 200 gigatons in glacial ice per year. From my estimates, in excess of 1,000 gigatons a year calves off in mostly shelf ice each year, still further cooling the Antarctic waters in this Ice Age that's already started. I think it's humorous it sneaked up on Al Gore while he was pontificating on global warming, and decrying fossil fuels and their emissions on burning.

You don't need a computer, calculator, or even a pencil to compute the excess glacial ice going into the South Pacific and Atlantic. Simply take the 4 feet coming in around the ITT Towers each year. Subtract the 8 inches equivalent to 200 gigatons from 48 inches. That leaves an excess of 40 inches. That 40/8 is 5 times the 200 gigatons, or 1,000 gigatons that's going out into the Atlantic and Pacific from Antarctica. That's a huge ice cube, which should be cooling the water all the time, and smoothing the shorter-term El Niño-La Niña Oscillation. Since from Vostok Ice Core data, the oxygen isotopes' temperatures down in the core is showing Antarctica cooling since the mid-Twentieth Century just like palynology data, and dendrochronology data. Al Gore uses manipulated junk science from corrupted meteorologists, who never hear of real-world data. Newsweek is a crapped up publication, infested with liberals like our local papers here.

Cold water coming north along our Washington and Oregon coast, has also increased plankton, sardines, herring, and other fish, so catches are up.

Increased calving of glaciers into the seas is because the glaciers are increasing their advancing and increasing mass balances. Global warming is a scam, a hoax, and a con game by totally irresponsible power-greedy people with no scruples. I have thought several times I should just stand back and let everyone find out what the natural climate has in store from natural cycles, the hard way (like in the past).

You will seldom see the proponents of anthropogenic warming even discussing the natural cycles that have run the climate in the past, because they are not competent to do so. Most meteorologists are functionally illiterate in estimating the interdisciplinary nature of real-world climatology, during the tenure of this totally corrupt administration.

So I decided to become more familiar with the 100,000-year cycle. It may in actuality be a Milankovich cycle plus an added solar cycle, that's a multiple of solar sunspot cycles; a fundamental harmonic, that can be plotted on a log graph, as a linear ascending line, or perhaps zone, like in research I was doing on data sent me by Prof. Emeritus Rhodes Fairbridge of NASA, and formerly of Columbia University (who has my added research interpretation).

My glacial terrace research, I have now plotted up on perhaps 28 USGS 7.5 min. quads, at a scale of 1:24000. I was fortunate that I had that scale, and such a fortunate contour interval where it's easy to recognize that there's a time sense to the contours when calibrated against sea core data that shows the 100,000-year cycle. When that is done, 40 feet is equal to 10,000 years. 400 to 100,000 year cycle. Except for the last one. Cascades went up 1,600 feet in the last 100,000 years.

I finished this study and sent all the quads to my editors at 21st Century, which produced my first map for publication.

My last map was Mt. St. Helens, and Mt. Mitchell south of it. The rate of uplift has been 2,600 feet in the last 340,000 years, from the terraces, or about half that in the Northern Cascades, or even Mt. Rainier. There is the old Pliocene erosion surface at 6,000 feet in elevation, with just a skim of volcanics. I have told both the USGS and FEMA about this. But even there under both volcanoes the rate in the last 100,000 years is up by 1,600 feet, increasing orosgraphic effect strongly.

They know about my research. Short descriptions of the involved quadrangles studied were sent to my editors. They have been authorized to publish this, and the maps, or put it up on their Web site at 21st Century. It will be interesting to see what happens.

If you can struggle through this letter you are welcome to use any of it.

The Neotectonic uplift of the Cascades has been one of my more interesting studies, though an outgrowth of 50 years of geologic research, a huge amount in the field. Rhodes Fairbridge thinks I must be one of the last boots-and-hammer field geologists left. There is an intimate relationship between physiography and structural geology, not really used as it should by present-day academia, like a hundred years ago. Professors today like warm offices in winter and air conditioning in summer. I wonder if computers are an excuse for not doing hands-on field work.

What I have been melding together is old, lost research, with modern-day methodologies. By the way, we have as a result of global cooling a West Coast energy crisis with a possible power shortfall, according to Seattle City Light, of 10%. They tremble at the thought of the Arctic Express this winter. They had better get their asses in gear and give up on the failed linear global warming hypotheses. They have already warned of rolling brownouts this winter, and raised power rates; but remain brainwashed by global warming. Guess they will have to learn the hard way. Wait until eventually this range fills up with ice again, which will wipe out their power plant dams, though the glaciers are growing already, so they will have plenty of hydro water, for a while.

Water is indeed falling around that Pacific atoll. Sea level is falling by 1 to 1.2mm a year, going into Antarctica. I would not try to tell anyone to move south. Buy long underwear — polypropylene, 3 pairs.

I'm thinking of doing next year's forecasting calendar.

When everyone finds out what's happening, it might get very crowded down south. Looks like time is running out on Al Gore, too, like global warming. Four feet of new snow in the Cascades, that's more than expected. Maybe even down here they are gearing up new snow removal equipment. 61SPZ data indicates, like a flickering switch, a major climate change can come in a three-year period. The next La Niña 2003–6 could be worse than 1993–6.

By the way, the Kebnakaise Mtn. in northern Sweden is going up at the same rate as the Cascades over the past 800,000 years … 4,500 ft., and has the same last big U-shaped cross valley profile indicating 1,600 ft in the last 100,000 years in my analogy of that quad I did for a professor at the Univ. of Stockholm, from the map he sent me. 800,000 years ago it was as flat as the Canadian shield in Sweden. That mountain is now at 1,500 meters with elevations like Table Mountain and similar glacial terraces and intervals in between.

**Randy Moeller KI7MU.** Every now and then, my wife and I take a look at our distilled water, raw food, full-spectrum lighting, books on child-raising, Scott Kirby's CDs, etc., and say, "We sure owe a lot to Wayne." You have made a huge difference in our lives.

Thanks, to the tenth power! We're going to have our first baby in a few weeks — he's responding well to the Prenatal Classroom lessons — and I love playing the "kick game" with him. We're also using a device called "baby-plus," which is a flannel bag with speakers. The mother straps it around her abdomen for an hour twice a day and it plays a series of rhythms that get more

*Continued on page 62*


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[k7ugq@cox.net]

# QRP Antenna Showdown

*What's the best antenna to use with your QRP rig?*

*More often than not, when you hear someone ask this question, they are looking for answers more in line with those for a query like, "Which antenna is going to give me the biggest signal, or the most contacts?" That is, they are talking strictly performance.*

How any antenna performs is a very important characteristic, without which there would be no wireless communications. However, if we can set aside an antenna's performance ability for a moment and give consideration to a couple of other important characteristics, the question stands a better chance of being answered correctly.

All too often the individual asking the question has not given thought about two other very important considerations for portable use; the intended "use" for the antenna and a familiarity with what's "available." Once the user understands and becomes familiar with these two issues, then performance can be given its deserving consideration as a determinate in deciding which antenna is best.

I have been told that religion, sex, and antenna "stuff" can be taboo discussion items. However, after having heard so many QRP hams ask this very question regarding best antenna selection, I feel the need to run the risk of being involved in such a taboo discussion. Note that I don't plan to include cost and ultimately "real value" into this discussion. The variables involved with real value are so numerous that this would be an article all its own!

It is not my intention to dwell into the performance aspects of these antennas either. The myriad of details is mind-boggling. There have been antenna shootouts conducted under controlled testing conditions that better provide results comparing one antenna to another.

Even more important than performance, the first step to finding the best antenna for your needs is to identify where and how you want to use your QRP rig the majority of your on-air time. For example, you might decide that ultimate mobile performance can be obtained by mounting a three-element beam on a 10-foot pole attached to the rear bumper of a minivan. Performance should be very good, but aside from looking silly and being expensive, it's unsafe and might not even be road-legal! Yet, there are several low profile antennas that are better suited for mobile, providing practicality over ultimate gain.

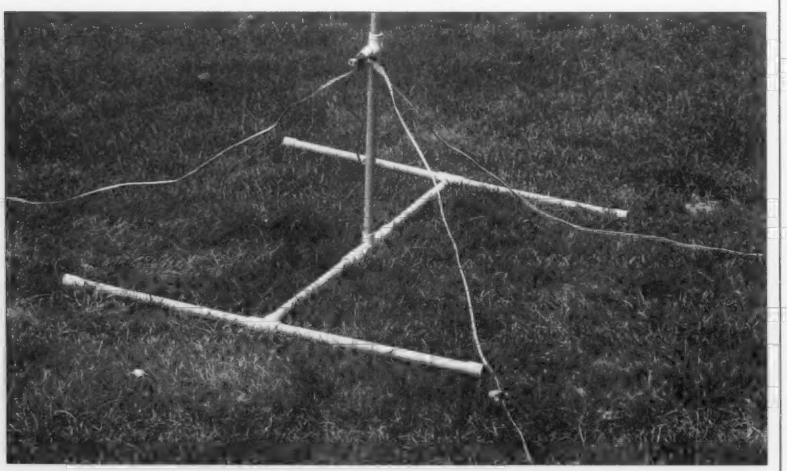

***Photo A.*** *Mounting base standard with the Minute Man 20.*

Or, if you're a hiker, a long wire antenna gets a little clumsy, if not impossible, on those mountain trails. Again, not a good choice for the specific application, in this example a pedestrian portable use. Thus the need to determine where and how (usage) the flea-powered rig will spend most of its "ON" time is the first consideration that needs addressing.

Another example of the importance of identifying usage lies with the simple rubber duck antenna. Consider this fact: There is no better antenna than the rubber duck type attached to a handheld rig while walking around a hamfest. Here you don't want directivity, don't need gain, and don't want anything protruding up into your sides when you're bent over picking up a prized goody. The right antenna for the right job!

Moving right along, let's first examine the basic groupings of the ways your rig can be pressed into service, and then examine what supports each.

Group 1: Pedestrian/fixed portable operation such as hiking, public service volunteering, and fixed such as sitting up on top of a mountain peak.

Group 2: Mobile operation such as in an auto, motorcycle, bike, boat, airplane, etc.

Group 3: Fixed station (home) use of the base station antenna.

Hams, the versatile lot we are, will likely try all three groups. However, after the experimenting is done, most will usually settle on one or the other. Within that one category, most operators will drill down even further, settling on one or two sublevels of the group.

For me, my FT-817 spends most of its time in Group 1 (fixed portable) and sometimes Group 3 (home). Thus, I have appropriate antennas that offer me the best performance within the limits imposed by the constraints within these two groups. Within the boundaries of my Group 3 hamming, I am restricted by my XYL, not restrictive covenants or CCRs!

I've listed some characteristics that I have found KEY for each of the 3 groupings. See if you agree and/or can add or change those characteristics that are more meaningful for your specific application.

PEDESTRIAN/FIXED PORTABLE. For hiking: reduced size, light weight, attaches directly to the radio, minimize the use of interconnecting coax, no radials (regardless of the improved performance); consider monobanders. For fixed portable operation at the family's beach cabana or on a mountaintop: some gain and directivity could be useful and easy to handle; any required rotation of an antenna should be the "Armstrong" rotation method; antenna, pole, and accessories should be easily assembled/disassembled and packed; may consider a reduced size and/or lightweight antenna if climbing is part of the trek to the operating site.

MOBILE OPERATION. The key nonperformance criteria here are physical characteristics such as wind loading and mounting methodology. Wind loading is a mechanical metric that you'll usually see offered by the manufacturers on larger, permanent installations, and hardly ever provided for the typical QRP/portable genre of antennas. However, you don't really need to be a mechanical or structural engineer to figure out if your antenna choices could stand up to whatever the fastest speed you'll be traveling is. Size as well as geometry of the elements must also be considered for mobile applications. A horizontally rigid dipole cut for 20 meters, regardless of how durable it is and how well it is welded to a motorcycle's frame, is probably not the best choice of this application!

FIXED STATION (HOME). A fixed base station QRP antenna installation usage does not have many of the same physical property limitations as the portable and mobile application does. However, depending upon city, state, and federal regulatory laws, the antenna choices may not be any easier than the above two. In my experience living in homes that had restrictive covenants (CCRs), I almost always had to go about practicing my hobby in somewhat of a clandestine fashion. At one such house I decided to run my coax line to the mobile antenna on my parked car in the driveway, and use


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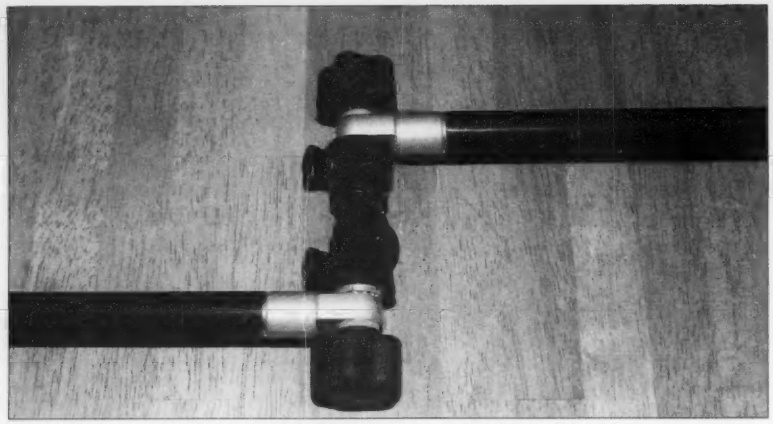

***Photo B.*** *Center insulator and position adjustment knobs for the Buddipole.*

small magnetic loops on portable tripods. Longwire antennas made from very-small-gage wire, tapping into the metal gutter system, or the concealed vertical within a fiberglass flagpole can all be made to work very well. Regardless, you'll need to keep size, weight, and the ability to be stealthy in mind before you settle on your antenna choice. Further information on dealing with CCRs can be found in the FCC's PRB-1 bill at [www.arrl.org].

Should you be one of those who lives where there are no restrictive covenants, then you're limited only by "best practices" techniques. Lucky you!!

**What's available**

QRP operation is not new. However, today it is credited for getting many hams back on the air. It is *so* popular that numerous manufacturers have begun marketing QRP-specific rigs coupled with a full array of accessories. My last (unofficial) count revealed that over 25 different antennas were being marketed as specialized QRP/portable antennas.

Almost weekly, new antenna products are appearing in magazine ads. Keeping up with all that's available is difficult and expensive. Over the past couple of years, I have acquired six commercially made portable/QRP antennas. As a way to assist in categorizing usage to decide what works best for your application, I've developed a table comparing my antennas. Within reason, you'll find that these six antennas fall somewhere within one of the three groupings above and represent a good cross-section of today's QRP/portable antenna offerings. A lot of time has been spent assembling, disassembling, transporting, testing, evaluating, and developing my personal opinion as to where these six antennas fit.

In your judgment I may be off base, and that's OK. It's like taboo subjects: There definitely are no two opinions exactly alike. There are many good antennas on the market in addition to the six I listed here. The object here is the same when making the comparisons.

The chart I use lists 10 categories, each exhibiting a numeric score from 1 to 3 with 3 being EXCELLENT, and 2 and 1 being OK and WEAK, respectively. The scoring is very subjective and opinionated. The values you see are those I placed on the antennas, my call. You can accept my values or alter them as you see appropriate. The end results should fit your needs and usage, other than performance as discussed earlier in the article. Addressing the usage within the categories is what's important. The rationale I used for scoring is as follows:

Frequency coverage: More points are given to those antennas that are multi-banded. If my specific applications were for a single band only, I would reverse this scoring.

Size, assembled, and disassembled: Smaller is important.

Ease of setup and teardown, including initial tuning and band changing: I don't want to spend a lot of time putting together the antenna, having to read a lengthy instruction manual, and having to pretune or trim parts of the antenna. (I don't do well at Christmastime assembling the kids' toys either!)

Portability when assembled: Specifically, can I easily walk around with the antenna attached to the rig if I want to use the radio while hiking?

Self-supporting/standing: If I decide to operate when stationary, will I need to provide some sort of pole and stand or wire guys to hold the antenna?

Quality of construction: Material selection, workmanship, appearance, all lead to product longevity. The repetitive process of assembling and disassembling the antenna is going to be the litmus test for durability.

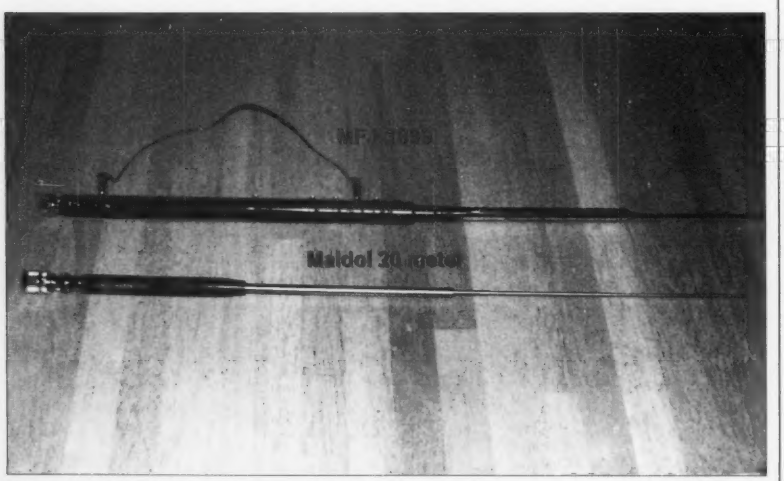

***Photo C.*** *The MFJ-1899 (ATX) and Maldol monobander antennas.*

## Wrapping up

Nothing is cast in concrete, that's for sure. If you add up all the data points on my chart for each antenna, you will notice that the Miracle Whip scored a perfect 30 points! You may or may not agree that the Miracle is excellent in all 10 nonperformance categories, but don't forget, a 5 watt, 50 ohm resistive dummy load would exhibit all the favorable nonperformance characteristics I've identified and scored excellent in the same categories.

Now it is up to you to insert a value, or better yet a multiplier, for performance. Performance data can be obtained from your very own experience or from organized efforts such as the HFpack [www.hfpack.com] group antenna shootout results. If all else fails, you could use the manufacturers' published performance specifications. If you do, make sure that all results are in the same unit of measure, dBs or dBi, etc.

I did not include the way I chose to factor performance but when I was done, the results can be seen by the order the antennas are listed in the chart. That is, for my particular QRP usage, the Buddipole and the Miracle Whip are the best antennas in this lot for my applications, all things being considered.

The idea of looking at and evaluating other antenna characteristics in addition to performance will prepare you for the process of selecting the best antenna for your usage. A QRP/portable antenna's purpose is to get you operating on the air in places where a larger antenna is not practical or feasible. Couple that with the challenge of QRP — that being to operate with low power, not with poorly chosen equipment — and you'll surely understand why all the characteristics of equipment selection must be given proper consideration. Performance and application, together, will yield the best antenna for any QRP/portable activity.

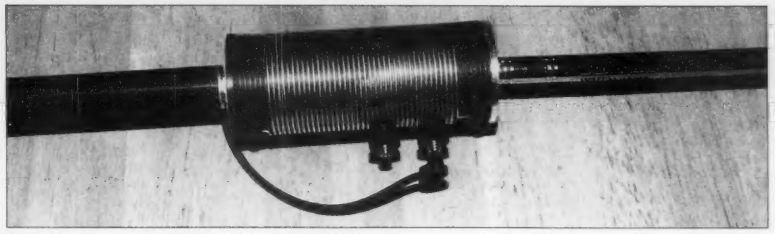

***Photo D.** The Buddipole's large loading coil.*

## Best of the tests

Individual highlights for each antenna used in this article are:

The Buddipole demonstrated super construction and excellent material selection, all pointing to expected durability in the field. This antenna uses stainless whips instead of the lower-cost, less durable aluminum, a nice complement of brass-threaded fittings and epoxy composite arms add to a beautifully designed antenna. Configuration versatility is an understatement with the Buddipole. The user can adjust the arms to make a horizontal dipole, centerfed vertical dipole, J-pole, "V" and inverted "V", etc., etc. A light-duty travel case comes with the antenna for transporting around. A standard of quality for all to strive for.

The Miracle Whip offered the widest frequency coverage. The small size of the MW made it a natural for throwing in my briefcase before leaving on a business trip. The designers chose top-notch materials, and used excellent workmanship skills when assembling this antenna. I found that the MW offered excellent performance when used as a short-wave receiving antenna, covering all the HF and VHF ham bands. The fact that you can also transmit on all the same bands was a plus. Note that for transmitting you really need a counterpoise.

The MFJ Super Loop was absolutely

*Continued on page 58*

| Antenna Model | Contact | Freq Coverage | Size | | Construction Quality | Ease of | | | Portability Assembled | Self-Supporting | Performance Merit (0–10, 10 highest) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Assembled | Disassembled | | Set-up | Teardown | Band Change | | | |
| Buddipole | 530-226-8446 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 0 | 10 |
| Miracle Whip | 866-311-6511 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 |
| MM-20 | www.qsradio.com | 2 | 2 | 3 | 1 | 3 | 3 | 2 | 1 | 3 | 10 |
| ATX/MFJ | 662-323-6551 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 6 |
| MFJ Loop | 662-323-6551 | 2 | 1 | 1 | 3 | 2 | 2 | 1 | 2 | 1 | 8 |
| Maldol | www.cometantenna.com | 3 | 3 | 3 | 3 | 3 | 3 | Monobander | 3 | 3 | 2 |
| 52Ω resistor | — | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 0 |
| Key: 3 = Excellent; 2 = OK; 1 = Weak | | | | | | | | | | | |

***Table 1.** Characteristics of six QRP/portable antennas.*

Jim Kocsis WA9PYH
53180 Flicker Ln.
South Bend IN 46637

# Field Day 2002: Out on Our Own

*Can you spell duct tape?*

*First of all, I should explain that this is a real account of what happened to my friend Tom WB8WIV and me during Field Day 2002. Tom and I have operated Field Day off and on for 25 years now. He lives 4 hours away and we switch off "doing" FD at each other's city almost every year.*

Last year, I wanted to participate in the true spirit of Field Day: set up a station in a location not normally used for communications, with minimal preparation of the communications equipment. I wanted to see what we would have to do to put a station on the air using whatever was at hand and to do it all under the (almost) worst conditions. Let me assure you that all the events described below really happened. We were ready at the start of Field Day, made many contacts, and had fun, too!

**Saturday morning, 7:00 a.m. local time (1200 UTC)**

I fixed a quick breakfast of cold cereal and juice, read the rules for the contest and found out we will be Class 1A. We will transmit with 5 watts of power (QRP-CW), have one transmitter on the air at a time, and use battery power. I figured a random-length dipole fed with 600-ohm ladder line and a tuner would work fine for the HF bands. We will use verticals for 2-meter and 450 SSB if I have time to put them up.

**8:00 a.m.**

I thought I had better get started on the HF antenna first since it would be the most useful, so I went out to the garage to look for some wire. Ah, there's some in my junk box on a reel! Now where did I put that ladder line? I looked in a box marked 75-ohm coax and 300-ohm twinlead. Nope, none there! Now, where could I have put it? I looked in the attic — none there either! I went back to the workshop where I keep a few parts and some wire. Aha! There it is, right beside my MFJ mobile tuner, spare speakers, and some other miscellaneous equipment — not where it should have been! I put together the antenna in about 30 minutes using some cable ties and a center insulator. Things are lookin' good! I put some lugs at the tuner end of the feedline and it was ready to go!

**8:30 a.m.**

Let's see .... an antenna for 2-meter SSB is next. I'll simply get my 28-year-old Ringo Ranger out from the attic and see how it works. Oh, no! I got it down and began screwing on the coax connector. Houston, we have a problem! The threads on the antenna SO-239 connector are stripped and I can't get the mating PL-259 coax connector on. Okay, it's time for major surgery on the antenna. I knew that the connector on the antenna would have to come off anyway, so I just attached the coax without any connectors. I stripped back the insulation on some RG-8 foam coax and soldered on some lugs. Then I attached the lugs directly to the ground connection and to the "ring" on the Ranger matching system. Good! That only took a half hour.

**9:00 a.m.**

Okay, now. On to the 450 MHz vertical! I shouldn't have any problems with that, right? After all, it IS new and has never seen the outdoors. I attached the coax in about 20 seconds! This is the way it's SUPPOSED to work! Okay, what will I use for a support? I went back up to the attic to get a 12-foot piece of pipe. I put the antenna on top of the pipe and grabbed a few open-end wrenches (from my tool rack in the garage) that seemed to be about the right size to fit the nuts on the U-bolt. None of them would fit! One was too large, the next size was too small. Oh, no! The hardware is METRIC! I went back inside to get my metric wrenches. I found the correct size and tightened up the mounting hardware,

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taped the coax to the pipe, and taped the coax fitting to waterproof it. I attached the whole assembly to a nearby rain gutter to complete the installation.

**9:30 a.m.**

Now I began thinking about how to get power from my car battery to the gazebo in our backyard where the station is to be located. Uh, let's see, it's only about 50 feet, so a length of RG-8 ought to be large enough to carry an Amp or two while running QRP on all bands. There can't be THAT much resistance in a 50-foot run of RG-8. Well, we will just have to see how it works — that's all that is available to get the power to the radios. After all, this IS supposed to be a simulation of an emergency, right?

I put some large solder lugs on both ends of the RG-8 coax and went back inside to look for a barrier strip for the station end so we could attach both rigs to the battery at the same time. (The person who said it pays to have a well-stocked junk box really knew what he was talking about.) I began laying out the power cable from the car to the gazebo. Ouch! I banged my head right into a hanging plant by the gazebo door! Oo-o-o, my head is pounding now! I told myself that I've just gotta keep going and just tough it out! An emergency waits for no one. (I'm exactly what is NOT needed during an emergency: another injured person!) I should have been wearing a hard hat!

**10:00 a.m.**

Now my thoughts turned to figuring out how to support the center of the HF dipole antenna. I know that I had a few more 12-foot lengths of 1-inch-square aluminum tubing and some long pieces

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of wood. I figured a good tall support for the HF dipole could be made by using duct tape to join a length of tubing to each end of a 10-foot piece of wood. I overlapped each end of the wood about 3 feet and taped the junction tightly every 6 inches. That should work nicely! (After all, as all fans of "The Red Green Show" on PBS know, duct tape is the handyman's secret weapon.) That should get the center up around 28 feet and give us a really good signal to the east and west from our QTH in northern Indiana! I attached the dipole and feedline and took the assembly to the backyard to put it in place. Oh no! I found a little present the neighbor's dog left for me. I also left the sprinkler system on so the grass is nice and wet. It's really humid now and the temperature is starting to climb. It's 90 degrees in the shade. It must be Field Day.

**10:30 a.m.**

Tom called on the phone and said he would be here around 1600 UTC. He said "... I'm bringing my Icom 706 to try out ..." That got me to thinking that his rig may be what saves the day for us since I recalled how my Ten-Tec Jupiter had some problems with very strong signals during a very busy CW contest a few months ago. Strong signals would appear at the actual transmitted frequency and a few kHz outside the IF filter bandwidth selected. I honestly don't know if that was the fault of the rig or me just learning to operate the radio but I DO remember the problem. The Icom has an analog IF filter (unlike the Jupiter's digital filter) that would probably work better with crowded band conditions. We'll just have to see how the Jupiter works and switch to the Icom if needed.

**10:45 a.m.**

I just remembered that it nearly always rains at some point during Field Day and that I had not sealed the feedline/wire junction on the HF antenna. So, back down comes the HF dipole. I went inside and borrowed some of my daughter's nail polish to paint over the soldered junction to make it watertight. Thanks, Revlon! (Or whatever brand it was — just as long as it provides a watertight seal at the antenna!)

**10:55 a.m.**

The HF dipole and UHF and VHF antennas are all up — things are LOOKIN' GOOD! The air temperature in the shade is 90 degrees and the sun is nearly overhead. It's time to take the radios into the gazebo and check out the operation of all rigs and antennas. I connected the Jupiter HF rig and checked and DOUBLE CHECKED the power supply polarity — I didn't want to see any smoke from the rig! (Years ago during one Field Day I actually did reverse the polarity, and thanks to a reverse protection diode we only blew a fuse in an old Ten-Tec. No one ever reverses polarity, do they? Heck, I'm employed professionally in electronics and I couldn't possibly do that — WRONG! That's what will happen during an emergency. Thanks to Ten-Tec: They had the foresight to put a little ol' 20 cent diode in there to keep the radio safe and sound.)

**12:00 noon**

Tom drives up, we have a quick lunch, catch each other up on family and job then decide to go out and have a listen before the flag drops at 1:00 p.m. local time (1700 UTC).

**1:00 p.m.**

Field Day officially starts for us and we make a bunch of contacts on 40 CW all afternoon.

**4:30 p.m.**

We're going along fine making contacts, laughing at mistakes we make, nursing down some cold pop and beer, then all of a sudden I hear a slight crash and see the HF dipole lying on the ground! Oh, no: The duct tape ripped! I ran inside and got some hose clamps to take the place of the duct tape. Of course I needed 4 and only had 3. Murphy, are you watching us? Okay, I'll fix you, Mr. Murphy! I went back inside and found two old aluminum C-clamps to take the place of the 4th hose clamp. I tightened them down really tight. They lasted the rest of the contest. Talk about patching things together — it was a classic Rube Goldberg!

**5:00 p.m.**

We were really taking a beating from the heat and humidity, so my wife suggested that our family and Tom go out for supper. We quickly agreed after racking up a screaming

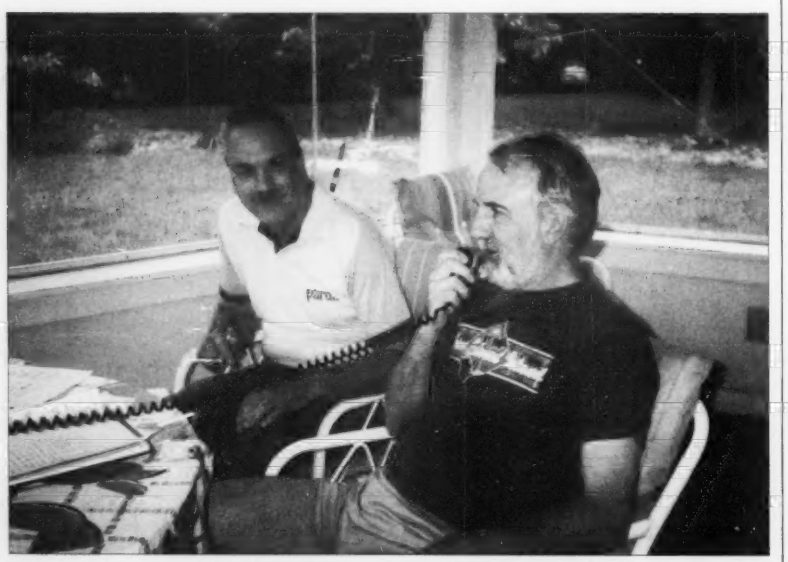

***Photo A.*** *Tom WB8WIV logs the calls while Jim WA9PYH handles the mike during their annual Field Day activity.*

32 contacts on 40 CW. The air conditioning in the car and restaurant felt so-o-o-o good! Okay, there may not be air conditioning in a real emergency and you probably wouldn't go to a restaurant, but we figured going to one would not give us a big advantage in the contest!

**6:30 p.m.**

We got back from the restaurant and decided to check the battery voltage. It was 11.6 volts no load and 11.3 volts key-down (5 watts), so I started the car engine to charge the battery. We got back on the air and knocked out a bunch more contacts on 40- and 20-meter CW.

**7:00 p.m.**

The temperature is still 86 degrees! Even though the gazebo has screens on all sides, I think that some hot air gets trapped inside, making it hotter than outside.

**8:00 p.m.**

80 degrees and 51 contacts total — we're still having fun but we're really feeling it from the heat. My wife and daughter came out to watch us for a bit and brought us some ice cream. We switched over to the VHF/UHF rig to check the sideband calling frequencies. We worked one local station on each band and that was it for phone. No band openings and no other stations. Back to HF CW.

**10:00 p.m.**

We both agree it's time to get some sleep. We're not that young anymore. No all-nighters on Field Day like when we were younger!

**Sunday 8:00 a.m.**

After a good breakfast we went out and hit it really hard, racking up many more contacts on 40- and 20-meter CW. This is REALLY fun!

**Sunday 11:00 a.m.**

Two hours to go and we've got over 100 contacts. A good night's rest and a good breakfast keeps us going.

**Sunday 1:00 p.m.**

Field Day is over and we racked up 122 contacts. 120 CW and 2 phone. Then we realized we forgot to copy the *ARRL Field Day Bulletin* for the extra points and never tried CW on VHF and UHF! Oh, well, there's always next year!

We had fun, learned a lot about setting up a station with no preparation and got a few more gray hairs. But we DID have a BALL! I knew we wouldn't place high in the standings but it was so much fun setting up a station and talking to stations using just battery power and a kluged antenna! If you're a ham you already know the excitement of that first contact from a new QTH. Setting up FD on short notice in a new location was nearly as much fun. To hear the transceiver come alive while running on a car battery is really neat when you realize you're all on your own with no commercial power. (We had our own little emergency due to an ice storm this past winter with no power for 5 full days — that's another story, though!).

Oh, yes: It never did rain. (In fact, it didn't rain for many weeks due to an extended drought in the Midwest.) But the HF antenna was ready for it with that nice nail polish. The Ten-Tec performed perfectly even with all those nearby strong signals! The hose clamps and C-clamps on the HF antenna support worked fine, too. The antenna was still up at the end of the contest.

Will we do it again this year? YOU BET! But it's at Tom's this year, so all I have to do is drive up to his QTH and enjoy! But next time I will have a much better appreciation of what can go wrong when you need to put a station on the air in an emergency situation. Like the Boy Scouts say: BE PREPARED! 73

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# Now Hear This!

*Home-brew yourself a magnetic headphone.*

*In the past few years, there has been an increased interest in the early days of radio. Periodically you will see articles published on the construction of crystal or regenerative radios. There was even a crystal radio building contest in 2001. I entered the contest, learned a lot and had a blast even though my project did not win. I attempted to make all of the parts for that radio. This is part of that project.*

With readily available items from your junk box or hard ware store, it is possible to fabricate a functional magnetic headphone that is sensitive enough for crystal (diode) radio operation. This headphone has been used with my crystal radio and performs well; the best part is that it is homemade. If you don't have the exact parts, experiment with what you have, and most of all, have fun; in the process you will learn something that will be useful. The materials and tools used in this project can be dangerous, so be safe in your work environment and use eye and ear protection.

**The nail**

The nail is 4" long and 1/8" in diameter; the box was labeled "16d" ("sixteen penny"). The head of the nail is about 1/4" in diameter. Prepare two pieces of wood, one 2" square and one 1.5" square (I used 1/4" oak for sturdiness) and drill holes in the center just slightly smaller than the diameter of the nail. Hammer the nail completely through the 2" piece until the nail head is flush with the wood surface. Hammer the nail into the 1.5" piece until you have about 2" of spacing between the two pieces of wood. File the nail head until it is smooth and it is about 1.0 mm above the wood surface. You may want to remove the pointed end of the nail; however, this is not necessary.

**The wire**

The wire used for this project is a

***Photo A.*** *Components for headphone.*

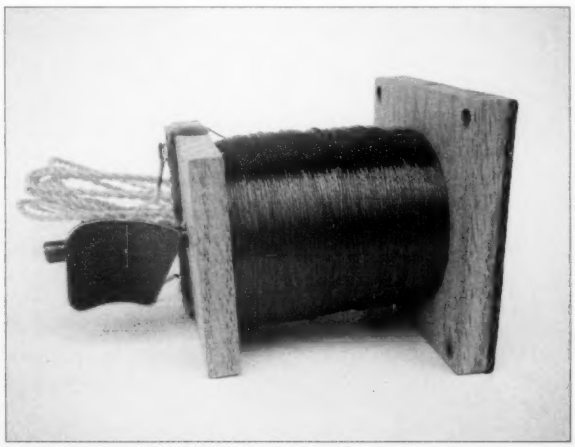

***Photo B.*** *Headphone (side view).*

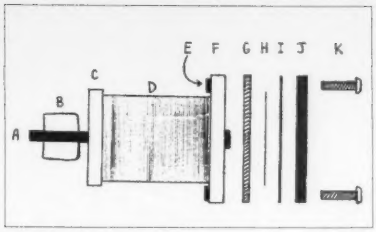


***Fig. 1.*** *Magnetic headphone assembly (see Parts list for key).*

1/2 pound spool of #32 enameled magnet wire available from Hosfelt Electronics. This is about 2,600 feet and about 430 ohms resistance as described in the wire table from the *ARRL Handbook*. Different diameter wire would probably work, although much smaller than #32 becomes hard to see and to work with. It will take many, many turns to get it all wrapped on the nail. I used my variable speed electric drill with the nail secured in the chuck like it was a drill bit, and the spool of wire on a piece of dowel mounted in a vise. The wire was guided with my fingers as it wrapped on the nail. The process took about 15 minutes. A possible source of wire may be an old transformer.

### The magnet

The magnet was salvaged from a junked computer hard drive. There are generally two odd-shaped powerful magnets in hard drives. If you cannot locate any magnets, All Electronics sells them. The magnet simply attaches to the part of the nail that extends from the wood. Other types of magnets work, too — it is just nice to find a use for these powerful ones.

| Fig. 1 Key Letter | Part |
|---|---|
| A | Nail (16d) |
| B | Magnet |
| C | 1.5 in. x 1.5 in. wood retainer |
| D | Wire wrapped around nail |
| E | 4-40 machine nut |
| F | 2 in. x 2 in. wood retainer |
| G | Cork gasket material |
| H | Steel diaphragm |
| I | Cardboard spacer (index card) |
| J | Cover (aluminum, plastic, or wood) |
| K | 4-40 x 3/4 in. machine screw |

***Table 1.*** *Parts list.*

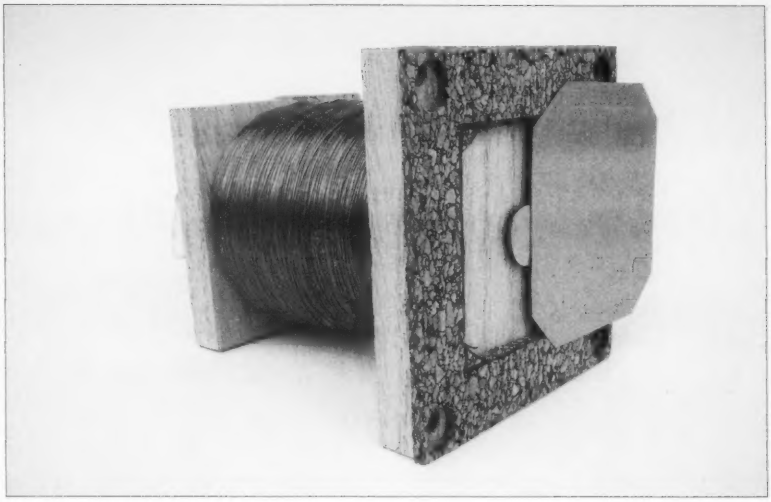

***Photo C.*** *Headphone (front view).*

### The steel diaphragm

Most tin can lids and bottoms have ruffles and ridges. A search in the store found a potato chip canister that has a very nice flat bottom piece roughly .08" thick. Also, frozen juice canisters have flat tops and bottoms. A sturdy pair of utility shears is used to cut the piece to the size you need for the diaphragm. If you want to experiment a little, try using different thickness steel shim stock. I have tried 0.01" through 0.05" and the best results were with 0.03" and higher. Steel shim stock is inexpensive and can be obtained from an industrial supply company. If the diaphragm is too flexible, it gets pulled into the magnetized nail and you lose the gap between the head of the nail and the diaphragm that is necessary for good performance.

### Final assembly

The key to success is the positioning of the diaphragm above the nail head as close as possible without the

*Continued on page 59*

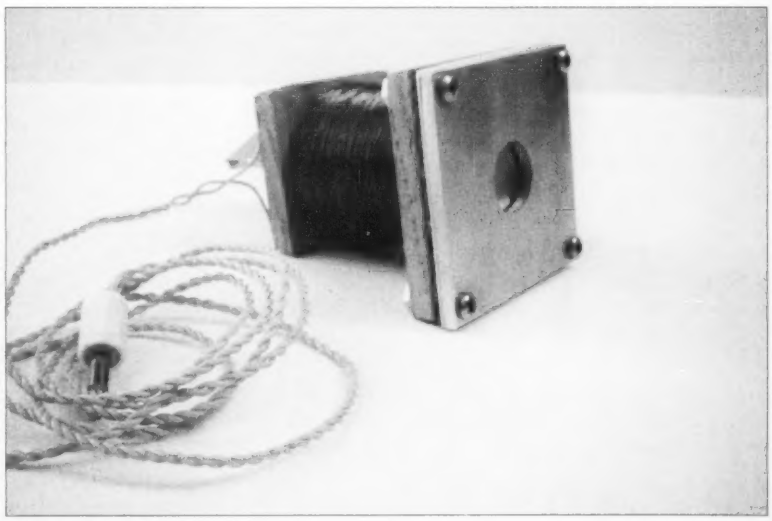

***Photo D.*** *Completed headphone.*

G.E. Smith W4AEO

# Yes, I Built Sixteen Log Periodic Antennas!

*Part 1: Theory and tests.*

*The broadband, unidirectional HF log periodic beam antenna was originally developed about 1957 (see references at the end of part 2). Although these very excellent beams are used extensively by commercial, military, and government agencies for both medium and long haul circuits, their use has been rather neglected by amateurs. I have assembled, erected, and tested a number of fixed log periodic wire beams since 1970 with excellent results and would like to pass along some information on these very efficient beams.*

I believe that the amateur fraternity may have overlooked or shied away from these antennas due to:

1) Very little information has been published on HF log periodics in ham publications, although there have been several articles covering these for VHF and UHF. (Listed in a previous LP article in the September 1973 issue of 73 M*agazine*, p. 42.)

2) These antennas are quite complex and are highly mathematical. Several pages of formulas, reference to log tables and four or five graphs or monographs are required for optimum design. This information was best presented to the hams in the May 1965 issue of *73*. Although this covered the design of VHF LPs, the formulas also apply to HF.

The antenna manufacturers producing LPs for commercial and military use program this data on a computer. By supplying the frequency range desired, gain required, etc., the computer prints out the element lengths, optimum element spacing, boom length, etc., to provide for maximum forward gain, front-to-back ratio, minimum beamwidth etc.

Although these formulas can be computed manually, several days may be required to design (on paper) an LP having optimum performance in a given space.

3) Most amateurs feel that log periodics are extremely expensive, which they are if purchased. The least expensive rotatable types by one commercial manufacturer are in the $1500 to $3000 range for a rotary covering 6 to 30 MHz, capable of 40, 20, 15, and 10m operation. Some of these are used by MARS stations. Rotatable LP ham antennas have recently been announced in the $300 to $1000 class.

The larger fixed types for the 2–30 MHz range having a higher gain are generally in the 10–30 "kilobuck" range. However, by assembling smaller, less complicated wire LPs for the 14–30 MHz range on a "do-it yourself" basis, one having an 8–10 dB forward gain (over a doublet

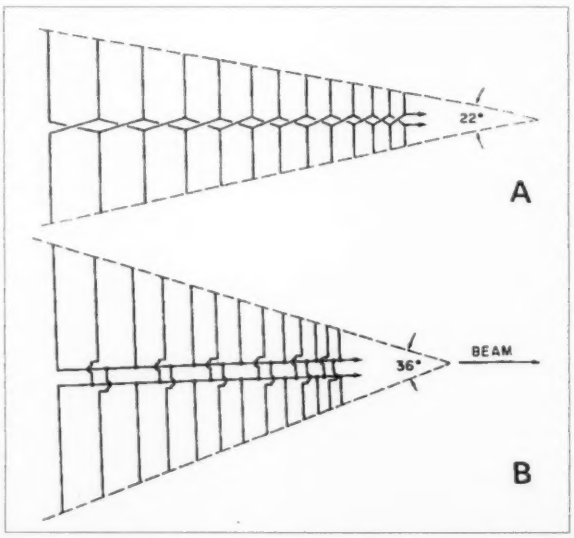


***Fig. 1.*** *Doublet log periodic configuration. This will cover a 2:1 bandwidth, say 7–14 MHz or 14–28 MHz.* ***(a)*** *has a 22° aperture angle and gives about 10 dB gain. Note the criss-cross method of transposition of the feeder.* ***(b)*** *is shorter, with a 36° aperture and about 8 dB gain. Note alternate method of transposition of the feeder.*

Reprinted from *73 Magazine*, March 1975.

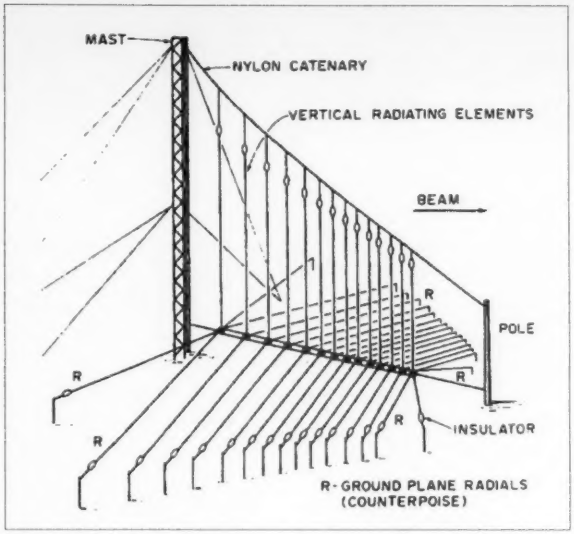


*Fig. 2. Vertical monopole log periodic — 2:1 bandwidth.*

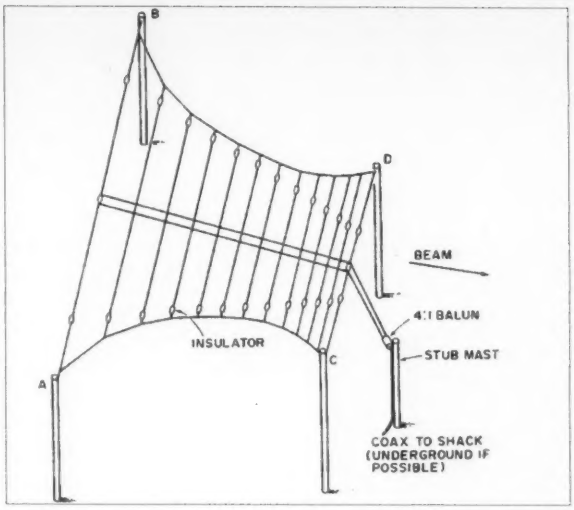


*Fig. 4. For method of transposing the center feeder see **Fig. 1(b)** and **Fig. 6**. Illustrates the four masts used to support the antennas.*

at the same height) can be assembled for a material cost of $15 to $25 not including masts or coax, which will vary depending on the particular site. The largest 17-element 14–30 MHz LP being used here, having a 12–13 dB measured gain, should cost about $19.50

4) Many amateurs believe a fixed LP requires a great deal of "acreage." This is true of the large commercial types having a 10:1 bandwidth or a single beam covering 3 to 30 MHz. These are 63.5–127 meters (250'–500') in length, some even 203 meters (800'). However, a 14–30 MHz LP for 20–15 and 10m having an 8 dB gain can be erected in a space 10.16m (40') wide by 12.7m (50') long. If the length can be extended to 17.78cm (70'), the gain can be increased to 10 dB compared with a doublet at the same height. By extending to 25.4m (100'), 12–13 dB can be realized.

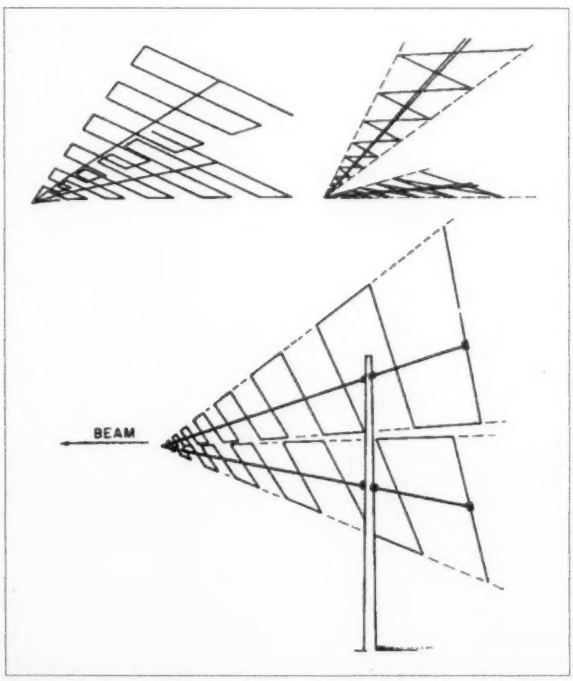


*Fig. 3. Trapezoidal log periodics.*

## Log periodic types

Log periodic antennas can be classified under three general types:

1) The doublet log periodic (DLP) configuration. **Fig. 1** illustrates this type covering a 2:1 (plus) bandwidth suited for a ham beam for 7–14.35 or 14–28 MHz.

2) The vertical monopole log periodic working against ground or a ground plane counterpoise. **Fig. 2** illustrates this type, also covering a 2:1 bandwidth.

3) The trapezoidal zigzag or sawtooth configuration, **Fig. 3**. This type, being more complicated and not too suited for HF ham applications, will not be covered by this article, which will deal only with the first two types.

Before outlining the construction of the doublet and the monopole types, a brief report will be presented covering the tests conducted here over the past four years.

## W4AEO test results on log periodic antennas

During 1970, the first log periodic was put up experimentally here for 20m and 15m only, to be compared with doublets and also a well-known "store bought" trap vertical for 40-20-15 and 10m (using separate radials for each band). The vertical had given fair results for DX, evidently due to its low angle of radiation and its 8.9m (35') height (at the base) above ground.

The first LP was quite simple, using only 7 elements for 20 and 15m and being only 9.7m (38') in length. The back end is supported by the peak of the roof, 10.2m (40') above ground, and the forward end by two cedar trees

| SWR Readings | | | |
|---|---|---|---|
| kHz | LP #1: 7-element 20 & 15 | LP #2: 12-element 20-15-10 | LP #11: 17-element 20-15-10 |
| 14.0 | 1.1:1 | 1.4:1 | 1.4:1 |
| 14.1 | 1.1:1 | 1.5:1 | 1.4:1 |
| 14.2 | 1.02:1 | 1.6:1 | 1.3:1 |
| 14.3 | 1.02:1 | 1.7:1 | 1.2:1 |
| 14.35 | 1.01:1 | 1.7:1 | 1.1:1 |
| 21.0 | 1.01:1 | 1.1:1 | 1.3:1 |
| 21.1 | 1.01:1 | 1.2:1 | 1.15:1 |
| 21.2 | 1.05:1 | 1.3:1 | 1.05:1 |
| 21.3 | 1.15:1 | 1.4:1 | 1.01:1 |
| 21.4 | 1.25:1 | 1.4:1 | 1.02:1 |
| 21.45 | 1.3:1 | 1.5:1 | 1.1:1 |
| 28.0 | * | 2.0:1 | 1.5:1 |
| 28.2 | * | 1.5:1 | 2.0:1 |
| 28.4 | * | 1.6:1 | 2.25:1 |
| 28.6 | * | 1.6:1 | 2.0:1 |
| 28.8 | * | 1.8:1 | 1.3:1 |
| 29.0 | * | 2.0:1 | 1.01:1 |
| 29.2 | * | 1.6:1 | 1.5:1 |
| 29.4 | * | 1.6:1 | 2.0:1 |
| 29.6 | * | 1.4 | 2.0:1 |
| 29.7 | * | 1.3 | 2.7:1 |
| kHz | LP #15: 5-element monopole 80 only | kHz | LP #9: 5-element 40 only |
| 3.5 | 1.2:1 | 7.0 | 1.05:1 |
| 3.6 | 1.2:1 | 7.1 | 1.05:1 |
| 3.7 | 1.1:1 | 7.2 | 1.01:1 |
| 3.8 | 1.2:1 | 7.3 | 1.1:1 |
| 3.9 | 1.4:1 | * | * |
| 4.0 | 1.25:1 | * | * |
| *Not applicable | | | |
| Also see SWR readings for monopole LPs in August 1973 issue of *73*, pp. 23-24. | | | |

***Table 1.*** *SWR readings.*

about 11.4m (45') high. It is beamed south, as I had been working friends in South and Central America also interested in improving beam antennas. They were capable of making good comparisons with the non-gain antennas previously used.

The results of these first tests amazed me and also the stations being worked. Reports on the non-gain antennas (at the same height as the LP) normally gave reports of S8–9 on 20m from these stations. I used a popular transceiver operated "barefoot." Switching to the LP, these stations would generally report an increase of two S-units, or at least a 10 dB increase over the doublet. Usually, when the doublet was giving S-9, they would give "20 over" on the LP. Although a 20 dB gain would seem exaggerated, the S-meter at this end would generally confirm this increase on their signal when switching to the LP.

It is realized that many S-meters exaggerate, but most are fairly linear and can be used for *relative* comparisons at the lower levels. Further, the S-meter here correlated very closely with the gain figures reported when switching to the experimental LP.

Although the original LP, **Fig. 4**, would only have a theoretical gain of 8–10 dB, LP gain figures are often based on VHF or UHF models tested over a line-of-sight path. It is noted that one of the large manufacturers of commercial and military HF log periodics (Hy-Gain) rates their 10–12 dB gains *"over average soil conditions."* It is therefore believed that this first experimental LP gives an honest 8–10 dB gain by averaging the many reports received from various stations to the south over the past 4 years. The S-meter on the receiver here is quite "Scotch." Generally, if a station reports a two S-unit or 12 dB increase when switching from the doublet to the LP, the S-meter here normally shows the same increase in his signal.

Since the original simple 7-element (LP #1) for 20 and 15m was put up in 1970, it has continued to give excellent results and is still being used as of this writing. Several others having more elements and greater length, providing greater gain, have been put up and thoroughly tested. Briefly, these are (in the order tested):

LP #2. 12-element, 17.8m (70') length for 20–15–10m. Now being used for the NE beam for W1s, W2s, and Europe.

LP #3. 12-element, 6.35m (25') length for 15–10–6m.

LP #4. 12-element, 10.16m (40') length for 20–15–10m.

LP #5. #2 tested on edge in the vertical plane or vertically polarized for about two weeks.

LP #6. 13-element, 22.86m (90') length for 40–20–15m. This was a "skip band" type with a portion between the 40 and 20m bands omitted. Two of these are now being assembled for permanent north and south beams.

LP #7. 5-element, 12.7m (50') length for 40m only. (See reference 18.)

LP #8. Two 5-element (same as #7) for 40 only; back-to-back in an inverted vee configuration suspended by a single center support line. One beamed north, one south — exactly 180° difference. Put up to obtain additional and more accurate forward gain and better front-to-back data on 40m.

LP #9. Improved 5-element, 40m only at increased height for additional forward gain data. Aimed south. Gave consistent 10 dB gain over doublet "standard" at same height.

LP #10. 5-element, 10m monoband LP. (See reference 18.)

LP #11. 17-element, 25.4m (100') length for 20-15-10, 15.24m (60') above ground. This is the permanent west beam that has a measured 12–13 dB forward gain to the west. By far the best and highest gain LP installed here to date. Side attenuation is down 25–30 dB.

LP #12. 6-element, 12.7m (50') length. Experimental for 20m only. 10 dB gain. Four additional forward parasitic directors (nondriven) were added later, but little if any increase in gain could be noted.

LP #13. 5-element vertical monopole LP for 40m only, using ground plane radials or counterpoise. Although this LP gave a 10 dB gain, it had an extremely low angle of radiation. Was good for DX, but horizontal doublet type LP #7 or #9 was better for normal operation.

LP #14. Same as #13 except inverted as an "upside-down" inverted ground

| LP# & Length | #1: 38' 7 els | #2: 70' 12 els | #4: 40' 12 els | #7: 50' 5 els | #11: 102' 17 els | Exp: 25' 5 els |
|---|---|---|---|---|---|---|
| Bandwidth | 14–22 MHz | 14–30 MHz | 14–30 MHz | 40 only | 14–30 MHz | 20 only |
| Element | Overall Length (ft.) | | | | | |
| 1 | 36 | 36 | 36 | 70 | 36 | 35 |
| 2 | 32 | 32 | 32 | 64 | 34 | 33 |
| 3 | 28 | 29 | 28 | 56 | 31 | 28 |
| 4 | 24 | 26 | 25 | 49 | 29 | 24.5 |
| 5 | 21 | 22.5 | 22 | 40 | 26.5 | 20.5 |
| 6 | 18 | 20 | 20 | | 24 | |
| 7 | 16 | 18 | 17.5 | | 22 | |
| 8 | | 16 | 15.5 | | 21 | |
| 9 | | 14 | 13.5 | | 18.5 | |
| 10 | | 12 | 12 | | 17 | |
| 11 | | 11 | 10.5 | | 16 | |
| 12 | | 10 | 9.5 | | 14.5 | |
| 13 | | | | | 13 | |
| 14 | | | | | 12 | |
| 15 | | | | | 11 | |
| 16 | | | | | 10 | |
| 17 | | | | | 9.5 | |
| Total wire for els | 175 | 246.5 | 231.5 | 279 | 345 | 141 |
| Spacing Distance (ft.) | | | | | | |
| 1 | 8 | 10 | 6 | 14 | 14 | 7 |
| 2 | 7.25 | 9 | 5.4 | 13 | 10 | 6.5 |
| 3 | 6.25 | 8.25 | 4.5 | 12 | 9 | 6 |
| 4 | 6 | 7.2 | 4.25 | 9 | 8.5 | 5 |
| 5 | 5.5 | 6.9 | 3.6 | | 7.5 | |
| 6 | 4.25 | 5.7 | 3.5 | | 7 | |
| 7 | | 5.35 | 3.2 | | 6.5 | |
| 8 | | 4.8 | 2.8 | | 6 | |
| 9 | | 4.3 | 2.5 | | 5.5 | |
| 10 | | 4 | 2 | | 5 | |
| 11 | | 3.4 | 1.8 | | 4.7 | |
| 12 | | | | | 4.2 | |
| 13 | | | | | 3.8 | |
| 14 | | | | | 3.5 | |
| 15 | | | | | 3.3 | |
| 16 | | | | | 3.0 | |
| Boom Length | 37.25 | 68.9 | 39.55 | 48 | 101.5 | 24.5 |
| x2 Feeder Wire Req'd | 74.5 | 137.8 | 79.1 | 96 | 203 | 49 |
| + Element Wire | 175 | 246.5 | 231.5 | 279 | 345 | 141 |
| Total Wire | 249.5 | 384.3 | 310.6 | 375 | 548 | 190 |
| Apex Angle | 29° (α = 14.5°) | 22° (α = 11°) | 36° (α = 18°) | 32° (α = 16°) | 16° (α = 8°) | 32° (α = 16°) |
| Approx. Gain | 8–10 dB | 10 dB | 8 dB | 10 dB | 12–13 dB | 10 dB |
| For Bands | 20–15 | 20–15–10 | 20–15–10 | 40 only | 20–15–10 | 20 only |

***Table 2.** Element lengths and element spacing distances.*


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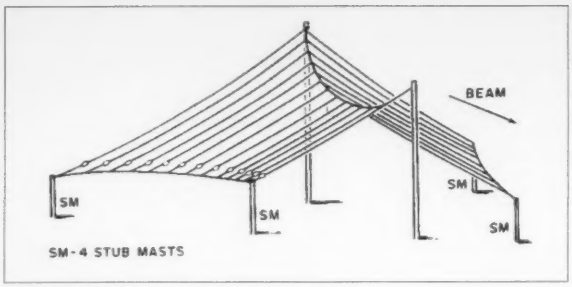


*Fig. 5. W4AEO inverted vee log periodic.*

plane. Strictly an experimental antenna to try for an even lower angle of radiation.

LP #15. 5-element vertical monopole LP for 80m only. Results similar to 40m monopole, LP #13. Good for DX but poor for close-by stations. Gave 10 dB gain (over 80m doublet at 11.43m, 45') from stations greater than 1500 miles.

LP #16. Trapezoidal LP for 20 and 15m only, both the zigzag and the sawtooth types tested.

In addition to the above LPs designed and tested here, several other directional antennas were erected for comparison with the LPs. Some of these were:

1) A 6-element, 15m "Long John" yagi mentioned below.

2) A 20m phased beam consisting of two 1/2λs in phase, collinear with two collinear reflectors and two collinear directors beamed toward Europe. Although this showed approximately a 10 dB gain, the lobe was much more narrow than the NE LP and the bandwidth quite narrow. At ±50 kHz, the SWR exceeded 1.5:1.

3) A 5-element Bruce array on 20m beamed for Caracas. The gain was lower than any of the LPs tested in that direction; possibly, being vertical, the angle of radiation may have been too low for this distance. It was only tested a few weeks.

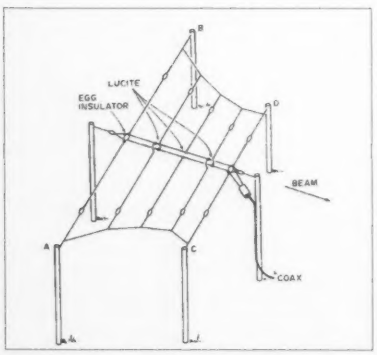


*Fig. 6. Five-element monoband log periodic — fine for any band 10 through 80m — see the Aug. and Sept. 1973 issues of* 73 Magazine *for details.*

In addition to the ham LPs assembled here, several other LPs have been designed "on paper" for friends and others, one covering 12–24 MHz for several MARS frequencies as well as 20 and 15m. These include several commercial LPs for 3–30 MHz, 2–4, 4–8, 6–12, 8–16 MHz; and several VHF and UHF for 30–50, 140–145, 150–470 MHz, including two for TV: 174–215 and 475–750 MHz. Several have been completely assembled for others on "custom-built" orders.

## YV5DLT–W4AEO tests

The most accurate 20 and 15m tests have been made with my long-time friend YV5DLT (ex-W5DLT) of Caracas. We have been constantly testing the LPs for several years. He is able to give very accurate readings on any changes made here.

During the original testing of the first three LPs, schedules were kept daily between 1200 and 1400 local time here as these hours gave the worst case conditions on 20m. Other schedules were kept on 15m.

It was during this period that the 17.78m (70') LP #2 and the 15 and 10m LP #3 were put up for comparison with the original LP #1, which had performed so well on both 20 and 15m. LP #3 was especially good during the 15m tests, generally showing 5 dB over LP #1 and even slightly better than LP #2; however, #3 was aimed at approximately 165°. Caracas is 149° true, 1854 miles statute. The other two LPs were approximately 180°. All three were about the same height above ground.

After several months of 15m tests on #3, we wished to make a direct comparison with a good yagi aimed in the same direction. I assembled a 6-element "Long John" yagi per reference 20, p. 104. This was erected to the side of LP #3, exactly parallel and aimed in the same direction; both were 11.43m (45'), or about a full wave above ground.

Several weeks were spent comparing these two beams. Invariably, YV5DLT would report LP #3 to be 3–5 dB better than the yagi. The S-meter readings here confirmed this.

## 40m LP tests

Most of the 40m tests were conducted over a period of several months with old friends W4QS and K4FBU in Florida at the same time daily. During this period, four different 40m LPs were beamed south for Florida at various times for comparison with a good 40m horizontal doublet at 11.43m (45'). One 40m LP #8 was also beamed north for comparisons in that direction. All of these LPs produced 8–10 dB gain in these directions over the dipole; however, many of the tests indicated as much as a 20 dB improvement, which was confirmed by the S-meter at this end and a number of other stations in various parts of Florida.

Since the usual 2-element 40m yagi or two extended 1/2λs in phase collinear do not normally exceed 3–4.8 dB gain, the 10 dB average gain of the LPs tested is worth considering — especially because of their low cost and ease of construction.

## 75 or 80m vertical monopole LP tests

A 5-element vertical monopole, LP #15, was assembled for 75m. Since the mast height limited the longest rear element (the reflector) to 16.51m (65', 1/4λ + 5%), this LP was limited to 3.8–4.0 MHz, and all tests were within this range.

It was soon evident that this vertical beam was strictly for longer range communications, due to its lower angle of radiation. The 1/2λ 80m dipole up 45° (not an inverted vee) used as

the "standard" was better for distances from 400–500 miles. Beyond this range, the vertical LP was better in the forward direction. At night the doublet was better to about 1000 miles; beyond, the monopole LP would show its increase, giving a good gain over its beamwidth.

For ranges greater than 1000 to 1500 miles, the 75m monopole, LP #15, showed at least a 10 dB gain over the dipole. However, for the normal working range on 80m or 75m, the doublet was better for the shorter distances.

A similar test using a 5-element 40m vertical monopole, LP #13, was conducted, with results similar to the 75m test. The horizontal doublet-type 5-element 40m LPs #7, 8, or 9 were better for normal operations, and the vertical monopole for DX. This beam was aimed NW.

During a predawn 40m test with LP #13, a W7 (working a VK on phone) in the NW, about 2,000 miles from here, was monitored. On repeated S-meter readings taken, the monopole was consistently 2 S-units or 12 dB better than on the 40m dipole when receiving the W7 in line with the monopole beam.

**Receiving advantages of the log periodic**

In addition to the excellent forward gain of the LP which is quite apparent to those being worked, the received gain is also quite noticeable. Another plus factor of the LP is its excellent diversity or "capture" effect during reception.

When QSB is bad on the dipole used as the "standard," switching to the LP reduces fading considerably, since the "readability" on the LP is much better.

Evidently the number of elements and its "boom length" produces the diversity effect due to its size and length compared with the doublet or even a smaller 3- or 4-element beam. The greater the number of elements and the greater its length, the better it performs for reception in addition to the increased gain apparent on both transmission and reception.

For those more acquainted with the yagi, the LP can be considered as a multi-element, unidirectional endfire array having a driven (rear) reflector, a 1/2λ driven "active" radiator, and a number of forward-driven directors.

LP theory implies that for a given discrete frequency within its bandwidth, 5 elements are generally excited or driven as an "active cell." However, while testing the 17.78m (70'), 12-element LP #2, it was excited with low power on 20m. RF voltage could be detected (using a neon bulb) on *all* elements except the long rear (reflector) element. The second or 1/2λ driven element (on 20m) was quite "hot" at the ends, as would be expected. The RF voltage on the driven director elements 3, 4–11, and 12 decreased gradually toward the forward end. Some RF could still be detected on the short forward element, 12.

Evidently these multi-element, driven directors add gain and also possibly help lower the angle of radiation in the E

*Continued on page 26*

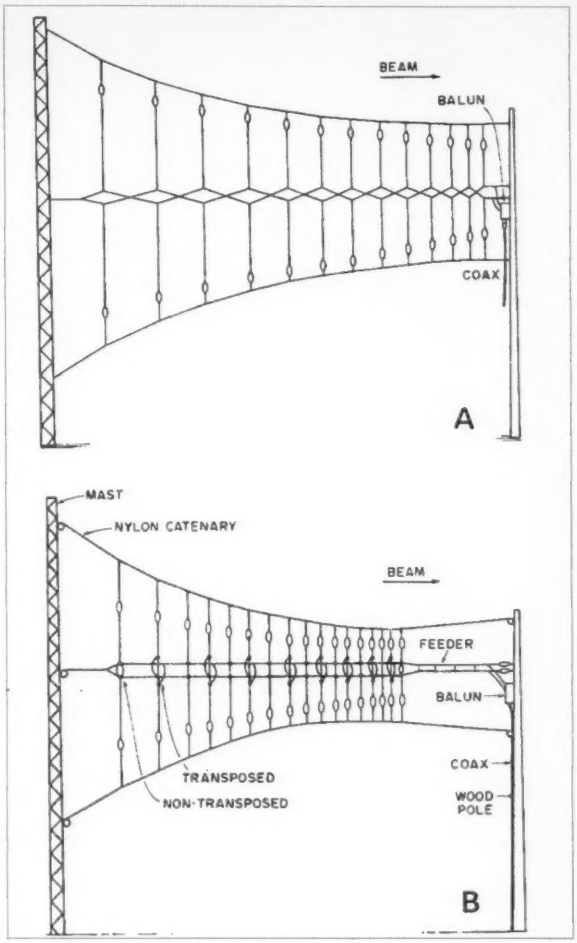


*Fig. 7. Vertical dipole log periodic — acreage-saver model.*

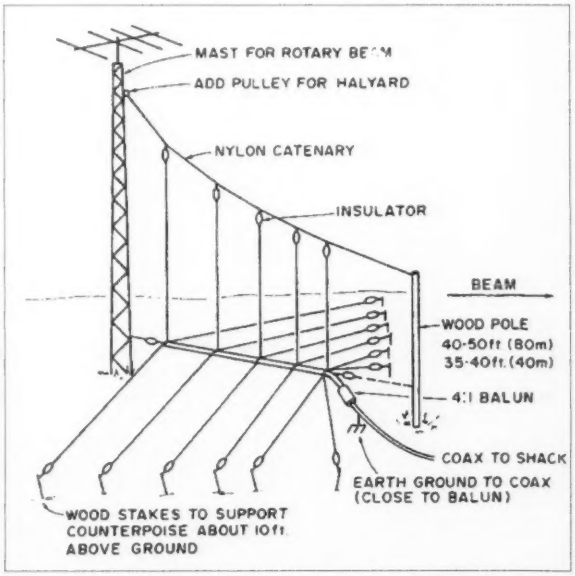


*Fig. 8. Single-band vertical monopole — for 40 or 80m. About 10 dB gain.*

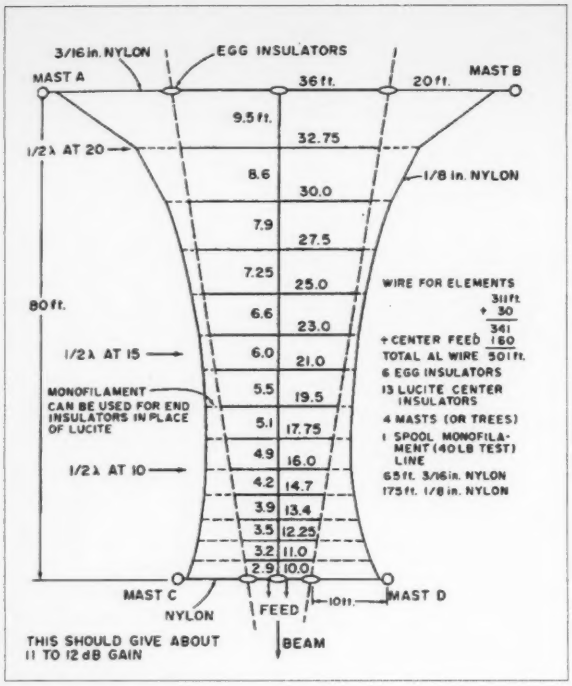


*Fig. 9. 15-element 20/15/10m periodic.*

## Yes, I Built Sixteen Log Periodic Antennas!

*continued from page 25*

plane and concentrate the forward lobe in the H plane. This may be the reason the apparent gain generally exceeded the theoretical during tests.

### Front-to-back ratio

The front-to-back of the LP is generally less than that of a well-designed monoband yagi. The LP seems to be 14–15 dB maximum with 10 to 13 dB as typical. From the tests made here, the front-to-back improves as the LP is raised to at least a 1/2λ above ground (at its lowest cutoff frequency).

The front-to-back or the 40m dipole LPs (DLP) tested appeared to be better for the horizontal than the inverted vee configuration, as would be expected, and the forward gain also better.

### The forward lobe

The forward lobe of the LP is generally wider (about 90–100° beamwidth) than that of a well designed yagi; however, for a large fixed beam, this is good, as it can be aimed to cover a certain part of the country or a particular DX continent. For example, the NE (LP #2) covers Europe quite well and the 30.48m-long, 17-element west beam (LP#11) seems to cover all of Australia. The side attenuation of this long LP is down 25–30 dB.

A W1, -2 or -3 could use one or two LPs to cover most of the states. A W6 with an LP beamed east would cover most of the east coast. At this QTH, 4 LPs will cover most continents of interest: NE, Europe; east, Africa (and Australia long path); SE or south, South America; west, Australia; and NW — Alaska, Japan, etc. One for SW may be tried later for long path to Europe.

### Fixed beam antennas vs. rotaries

An advantage in using several fixed beams over a single rotary is that they can be switched instantly from one to the other (and to the doublet used as a "standard"), whereas it takes some time for the rotary to swing, making quantitative readings difficult (especially when QSB is bad).

Another item noted during the first year these LP tests were started: About half the stations worked during the winter of '70–'71, using rotaries, would come back, "Sorry OM, I can't swing my beam, it is frozen up for the winter." I noted less of this problem the second winter. Evidently better rotators are being used.

The following comments are comparisons of the LP with several other beams.

### Compared with the yagi

As more hams no doubt use yagis than other beams, these will be compared first. A well designed and properly adjusted 3- or 4-element monoband yagi should give about the same gain as a moderate-size 20-15-10m LP when both are at the same height above ground. The LP will, of course, cover all frequencies 14 and 28 MHz and can be operated with a comparatively flat SWR any place in the three bands. The bandwidth of a high-Q yagi may be limited to a portion of a band as the bandwidth at resonance may be only 2.5%.

Compared with a triband yagi for 20-15-10m, which is generally a compromise antenna, the LP should give the greater gain.

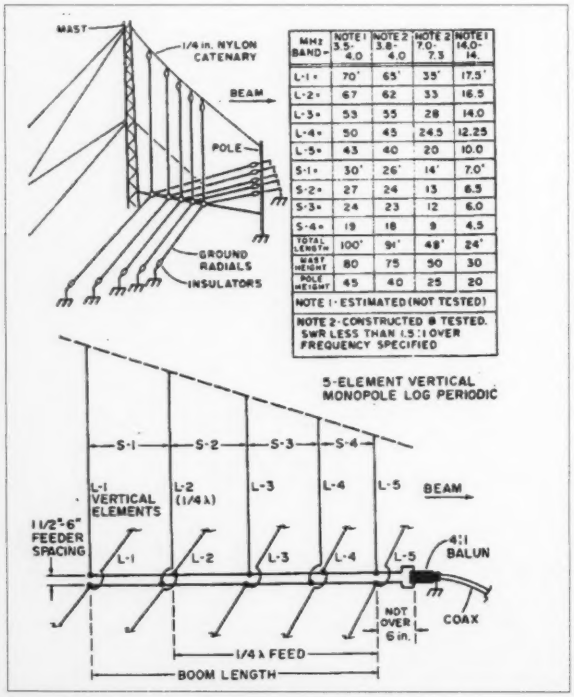


*Fig. 10. 5-element vertical monopole log periodic*

Of all the contacts made while testing these LPs during the past four years, not a single station worked (most using yagis for 20, 15 and 10) had a doublet for use as a "standard" or test antenna for comparison with this beam. Many have been most cooperative in rotating their yagis the full 360° to demonstrate the front-to-back, but none were able to demonstrate its forward gain. The front-to-back on some of the monoband yagis was quite good, while others were very poor.

One MARS station worked had both a rotatable LP and a yagi. He obliged by rotating the LP 360°, which gave a good demonstration of its pattern. When both antennas were beamed in this direction, the LP showed greater gain; however, he did not have specifications on the yagi.

An advantage of having several fixed beams for various directions is that they can be selected instantly by a coax switch or relay. This allows for more accurate data in comparing antennas. Even under fading conditions, a fair comparison can be made by switching rapidly and averaging the readings.

### Compared with a rhombic

Anyone having room for a rhombic certainly has room for several LPs for various directions and is then not limited to one direction as with the rhombic.

The TCI engineers (Technology for Communications International of Mountain View CA) advertise their "Extended Aperture" LP, which is only 60.98m (200') in length and has a gain of 17 dBi. A rhombic to produce this gain requires a length of 518.29m x 228.66m (1700' x 750') width according to the TCI ads.

Further, the gain of a rhombic generally decreases at its low frequency end (fewer wavelengths per leg), whereas the gain of the LP is approximately the same over its bandwidth. If anything, at least from the tests here, the LP seems to give slightly better gain at the low frequency cutoff end. The forward lobe of the LP is generally wider than the rhombic, requiring less accurate aiming than the latter.

### Compared with phased arrays

To date I have only made comparisons with two phased arrays on 20: a 5-element Bruce and a 6-element collinear array mentioned above, both strictly single band antennas. Neither gave the performance of the LPs. I do plan to test the LP vs. a multi-element Sterba curtain or similar stacked arrays later.

### The SWR of log periodics

As a general rule, the SWR of an LP does not exceed 2:1 over the bandwidth for which it is designed, i.e., 14–28 MHz. From the tests here, the SWR over an entire band, 7.0–7.3; 14.0–14.35, or 21.0–21.45 does not exceed 1.5:1. **Table 1** gives some of the readings taken from several of the LPs tested. (Also see reference 18 for SWR readings taken on the monoband LPs.)

### Log periodic site selection

The first step is to determine if space is available for the LP when beamed in the desired direction. The second step is to decide the desired bandwidth or the bands it must cover and the gain desired. These will, of course, determine the size (length) of the LP and if it will "fit" the space available.

The long rear element (reflector) must be at least 5% longer than the lowest cutoff frequency. The short forward element should be 50% shorter than the high frequency cutoff. The pages of math required for their complete design will not be presented here. (See references 2, 3 4, 5, 8, 11 and 13.)

To simplify the design and eliminate the formulas entirely, **Table 2** presents in tabular form some of the doublet-type LPs (DLP) assembled and tested here for the ham bands as mentioned above. (Dimensions for single band LPs were given by reference 18.)

This tabulation gives frequency bandwidth, element lengths and element spacings, overall (boom) length, apex angle, etc., of each.

Similar information on the vertical monopole LPs for 40m and 80m is supplied by **Fig. 10.**

If space is available for an LP at your QTH, at least one of these can be tried.

**Fig. 4** is a sketch illustrating four masts used to support a typical DLP for 20-15-10m. These masts can be inexpensive 12.20m (40') collapsible guyed TV masts, power poles, towers, trees (as used here), or other supports if available.

**Fig. 5** illustrates two high and four stub masts for an inverted V-log-P which I call my "λ-log-P" configuration.

**Fig. 6** illustrates a simple 5-element monoband LP that requires the least space. This is especially adapted for 40m. (See reference 18 for complete information.)

**Fig. 7** illustrates an "acreage-saver," using a DLP on edge in the vertical plane. This only requires one high and one lower mast and little width.

*Continued on page 59*

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## NEVER SAY DIE

*continued from page 7*

### Conspiracy?

When I claim that the AMA and the medical industry seem to be colluding to hide the fact that any illness can be cured without the need of any drugs, some people put me down as another conspiracy wacko. Never mind the common sense of what I've been writing. And never mind the damning statement of the AMA's chief counsel.

See for yourself at [http://educate-yourself.org/fc/drugstory.shtml].

What you'll find is that the Rockefeller interests, starting back in 1910, have gained tight control of the major drug companies, our major newspapers, the radio and TV networks, the AP, and even the Fed, which issues of our money.

The drug industry is particularly choice because it produces such incredible profits.

Please download the story so you'll see how you and your family have been had big-time.

### College, My 2020 Vision

With the best brains in the world in any field as advisers and professional actors as teachers available inexpensively via interactive DVD educational programs, a university campus will have to provide more than lectures and endless tests of short-term memory ... which have been the core product supplied by colleges and universities for over a century.

The students of 2020 are going to be able to pursue knowledge anywhere in the world their DVD player and Internet connections can take them. Unless a university is able to provide hardware beyond that available via computer simulation, it may be difficult to attract students.

### Reviving 78s

One of the personal computer pioneers, George Morrow, after the crash of Morrow Computers, retired with his collection of thousands of old 78 records in Hillsborough, CA. He was going to apply some computer magic and make the old 20s and 30s jazz music available again on CDs. His approach was to digitize three of the old records and let his computer select each byte where two were identical, thus cutting out most of the record's surface noise.

Next, by comparing second and third harmonics of bass notes cut off in the vinyl recording process, he was going to enhance the bass.

When I sold out my computer magazines, I lost track of George, and recent letters haven't been answered. But he sure had a great idea. Someone should do it.

I remembered this while listening to a local radio station playing 1920s records.

When I get some time, I'd like to make some of my 78 collection available over the Internet. It's out in the barn and should be preserved. No, I don't have three of every record like George. But songs like "Life Gets Tejus, Don't It," ought to be available again. And Rosalie Allen singing, "Can't You Take It Back and Change It For A Girl."

Oh, by the way, about how many minutes a day are you spending sitting down, relaxing, and listening to music? How many times do I have to nag you about the importance of de-stressing your body with good music? For me there's nothing more relaxing ... and exciting, in a way ... than leaning back in an easy chair and listening to Wagner's Rienze Overture or Franck's Symphony in D Minor. Ahhh, nirvana!

### New World Order?

Another militia-type rumor arrived from one of my readers. He'd heard from a "reliable source" that Gunderson Steel, in Washington, has made 140,000 railroad boxcars for the government, each fitted with 143 sets of handcuffs. That's handcuffs for 20 million people.

Well, killing 20 million people actually did happen in Russia under Stalin, and in China under Mao, so it's not without precedent. Hitler came close. But, presuming that these boxcars can be used more than once, maybe we're talking about handling 100 million or even 200 million Americans. Hey, that's everyone except the guards and train crews.

What a crock.

First of all, (1) our country isn't worth much without people. We're the golden goose — 99% or more don't know what's going on and don't want to know. The few that do don't know what to do about it. Secondly, (2) killing off 20 million people, unless you use bioweapons or nukes, is a major undertaking. Hitler's helpers managed to kill off about 12 million people, but it took them quite a while. By the time you jam 143 people into a boxcar all you'd have to do is lock the doors. The handcuffs wouldn't make much difference.

If you're not going to kill them, (3) you'll need massive toilet facilities and an awful lot of food and water — plus a lot of trustworthy guards. (4) Where in the country could they hide 140,000 boxcars? At 20 per acre they would fill 7,000 acres. (5) And how about the hundreds of engines and train crews needed to move boxcars full of screaming people around? (6) All this would take a lot of fuel, which means that all of the businesses involved in getting fuel to the railroads would have to be left in place — all the way back to the oil wells in Saudi Arabia.

Crock.

I'm a lot more worried about the pole shift Nostradamus and a bunch of others have predicted than the New World Order.

### Amelia

Reader Schmeusser was kind enough to send me a newspaper clipping about two groups heading for the Pacific to look for signs that Amelia Earhart crashed either on Nikumaroro or somewhere near Howland Island.

Well, unless the natives in the Marshall Islands, where I spent a couple of submarine rest camp vacations on Majuro in 1944, were lying, she and Fred Noonan crash-landed in the Marshalls in 1937. Then, they said that the Japanese navy came a few days later and picked up Amelia, Fred, and their plane and took them to Saipan.

When we stopped off to refuel at Saipan the natives there confirmed that Amelia, Fred and their plane had been brought there. They said that Fred had been injured in the crash and died, but that Amelia was held there until just before the Americans came and took the island.

It's interesting that Fred Goerner got the same story from the natives at Majuro and Saipan when he visited the islands many years later. It's interesting too that our navy did everything it could to keep Goerner from visiting these islands. It's quite a story. Look it up in your library.

My interest, for newer readers, is that Amelia was a good friend of my dad's. She had dinner with us several times, and she kept her Lockheed at my dad's airport.

Shortly before her 1937 flight, Bob Wemple, her chief mechanic, visited us for dinner and said he'd been working on her Electra, installing larger engines, extra wing tanks, and cameras. He said that the whole purpose of the around-the-world flight was so she could over fly the Japanese navy installation at Truk and get photos for our navy. President Roosevelt, previously the Secretary of the Navy, had asked her to do it. They knew the Japanese were doing something important there, and wanted to know what.

The higher-powered engines, Bob said, were so she would be able to fly from Lea, New Guinea, to Howland Island via Truk in the same time that her regular engines would have taken.

Only she missed Howland.

If you look at a map of the Pacific you'll see that her only practical choice was to either fly west to the Gilbert

Islands or northwest to the Marshalls. The Gilberts, being few and far between, were not a good choice. So I wasn't surprised when the Majuro natives said she'd flown to the Marshalls. It all made good sense.

Amelia, clearly being a spy, was captured by the Japanese and eventually executed.

Our government has been covering all this up because it was embarrassing that the most famous woman in the world had been made a spy and therefore was legally executed.

But, after over 60 years, perhaps it's time to come clean.

**The Liar**

President Clinton set a new low in presidents. He was a liar. Over and over he was a liar: when he said he hadn't perjured himself; did not conceal evidence; did not conspire to intimidate witnesses; that all these things were just personal mistakes; that the raw files on 900 Republicans was not for the purposes of blackmail; that those files came to the White House by mistake; that Hillary did not benefit from the guaranteed commodities trading transactions; that this was not a bribe; that he did not receive millions of campaign dollars from China; that he did not personally intervene to aid the transfer of military technology to China (to use against the U.S.); that these two actions were not connected. Well, you can add to the list for me.

**Competition**

Barnum was sure right about suckers, only he vastly underestimated the sucker population. Politicians, who are experts in sucker manipulation, have been taking advantage of people's gullibility for thousands of years.

Case in point is the golden glow of price controls. Whee, those greedy businessmen are going to be forced to sell us something at a lower price than competition dictates. Never mind that in all of history price controls have never worked. And that includes rent controls.

The recent power shortages were caused mainly by price controls. Nixon made everyone feel good with price controls. But not for long. The price-controlled stuff quickly disappeared from the market, replaced by "new" models, which were not price-controlled, and cost a lot more.

The more that the government meddles with markets, the more they mess them up. Rent controls have resulted in millions of buildings being destroyed. Drive the Cross-Bronx Expressway sometime to get the picture.

Competition brings us the best products at the lowest prices. Don't mess with it.

Then, along come monopolies, which give us bad products at high prices. Like the post office. Monopolies stifle innovation and defraud the customer.

Look at what happened to telephones when the government broke up the Bell monopoly. Before that we had very little choice of instruments. There were no cell phones, no answering machines, touchtone "dialing," wireless phones, and so on. Bell minions installed every phone and we weren't permitted to mess with the wires. We couldn't attach anything to their wires. We couldn't buy the phone instruments, we had to rent them from Bell. And ask any old-timer about long distance rates! We didn't make long distance calls unless it was an emergency, and then we went to the nearest Western Union or Postal Telegraph office and sent a wire. A ten-word wire that was delivered by boys on bicycles.

Have rent controls helped low income families? Surveys have shown that they're quickly taken over by higher-income families, who pay the lower-income families a premium price to move.

Another beautiful example of a monopoly providing bad products at premium prices is our public school system. Our kids are forced by law to attend these government institutions. In NYC's inner-city schools the schools spend $8,000 a year per student, and half of the students never make it to graduation. Parochial schools in the same areas spend about $3,500 and nearly all graduate and most go on to college.

Look at the AMA's medical monopoly. We have, as a result, the most expensive so-called health care in the world and, according to the Department of Health, less than 2% of us are truly healthy.

Wow, are we suckers to put up with this baloney!

Then there's our post office with its government-guaranteed monopoly. While the prices on everything else have been dropping, we've just had another postal increase. If you could get your congressman to have the guts to get rid of that monopoly we'd see the cost of sending letters dropping. Sure, we might have to standardize envelope sizes and print the labels on our computer printer to get the 10-cent price.

Meanwhile, more and more of us are using E-mail.

**What's It Take?**

The Medical Mafia is at it again! According to *USA Today,* schools and courts are putting pressure on parents to drug their children with Ritalin or have them taken away from them under charges of child neglect. All it takes is for school officials to diagnose a child as suffering from "attention deficit hyperactivity disorder" (ADHD). And never mind the causes ... such as boredom with the unchallenging schoolwork. Or, far more likely, being fed a high-sugar breakfast of sugar-coated cold cereal or pop tarts.

And also never mind that all of the anti-depression drugs such as Ritalin, Prozac, Zoloft, Paxil, and so on have well-documented histories of causing manic behavior. Every one of the school shootings has involved kids on these drugs, usually forced on them by the school authorities.

There doesn't seem to be any movement to educate school shrinks and social workers on the subject. These people pay no price for being wrong, so they've no interest in educating themselves. It's just the kids and the parents who have to pay the price for this drug madness.

**Genetic Engineering**

The usual shrill, uneducated, but vocal groups are crying out against the rash of genetic engineered foods that are being produced. The Europeans, particularly, are very upset over Frankenfoods.

It's interesting that the first independent, non-industry-sponsored study of the effect of these foods on animals was made public three years ago. Arpad Pusztai, the researcher at Rowett Research in Aberdeen, Scotland, reported his findings on British TV.

He reported that rats fed gene-modified potatoes had substantial organ damage, a thickening of the small intestine, and poor brain development. The result was a public furor.

Rowett's director, Philip James, quickly fired Pusztai, said the research didn't exist, broke up his research team, seized the data, and stopped six other similar projects. It then came out that Monsanto, a leading U.S. biotech firm, had given Rowett Institute a $224,000 grant.

*Lancet,* the British medical journal, published Pusztai's peer-reviewed paper supporting the research.

What about the FDA? What do you think? Their stated view is that biotech-engineered foods are about the same as any other foods and thus are not required to be tested before being put on the market.

The biotech firms are doing everything they can to make sure Congress doesn't require biotech engineered foods to be labeled as such.

Not that people who are buying stuff from the giant food companies can avoid

*Continued on page 33*

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# Travels with Henryk — Part 13

*Borneo hams strut their stuff.*

*Borneo is one of the largest islands located on the Equator in Southeast Asia. The island is shared among Malaysia, the Sultanate of Brunei, and Indonesia. The Malaysian part is called East Malaysia and consists of two states: Sarawak (9M8) and Sabah (9M6). A few islands off the coast of Sabah count as the Spratly Islands, and the prefix 9MØ is used there.*

I arrived in Sabah by air to Kota Kinabalu. The city has grown immensely since it was totally destroyed during WWII. This area was called British Borneo until the '60s, and the city was called Jesselton then. At the airport I was met by Doris 9W6DU and Alfons 9M6MU (**Photo A**). We drove almost 100 miles to Hillview Gardens, a hotel combined with an amateur radio club.

Next morning, I met Ralph DK3GH (**Photo B**), who was revisiting Hillview Gardens. I stayed in a small bungalow (**Photo C**) surrounded by antenna towers. The radio room is in the main building now, but initially it was in this bungalow. There are a few operating positions for HF and one for 50 MHz. They even have a 50 MHz beacon. The main station consists of a modern Icom transceiver and a medium-power linear amplifier (**Photo D**). Exactly how many antennas there are is hard to tell (**Photo E**). The main tower carries large arrays for the 40- and 20-meter bands (**Photo F**), as well as a 2m FM repeater antenna. A good Internet connection is available, and the club has an informative Web site at [www.qsl.net/9m6aac].

Another visitor arrived at 9M6AAC a few days later. Barry VK2BJ came

***Photo A.** Doris 9W6DU and Alfons 9M6MU at the Kota Kinabalu airport.*

***Photo B.** Ralph DK3GH and Alfons 9M6MU at Hillview Gardens.*

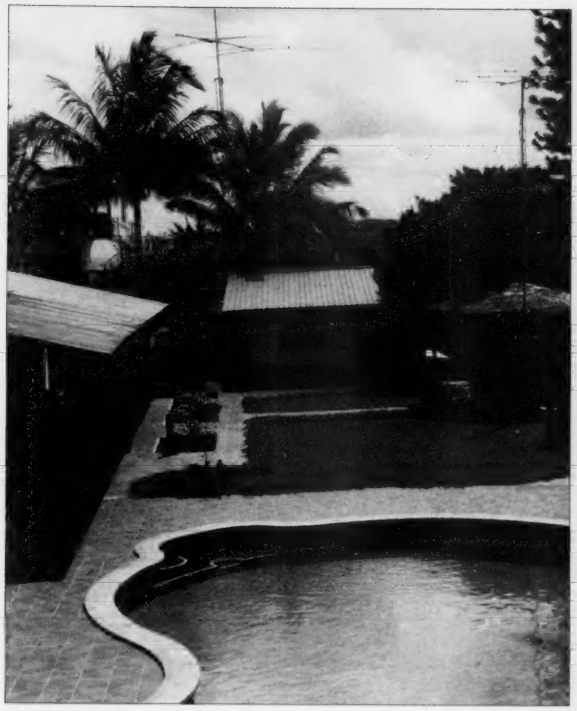

***Photo C.*** *A few antennas are visible in this view of the 9M6AAC club station at Hillview Gardens.*

***Photo D.*** *Doris 9W6DU at the 9M6AAC microphone.*

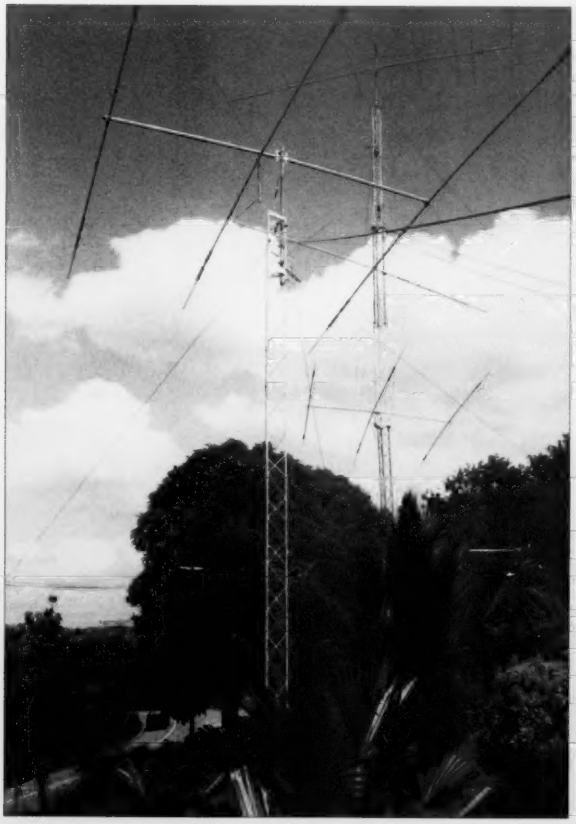

***Photo E.*** *More antennas of 9M6AAC.*

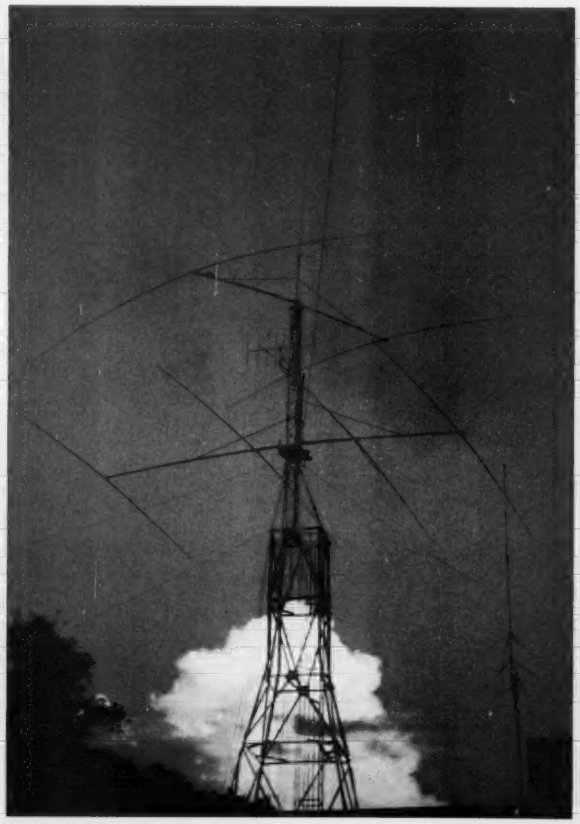

***Photo F.*** *The main tower of the 9M6AAC club station.*

**Photo G.** *Alfons checking E-mail while Barry VK2BJ looks on.*

**Photo I.** *QTH and antenna of Phil 9M6CT.*

**Photo J.** *Butternut vertical attracts snakes at 9M6AAC. (A different kind of tuning loop?)*

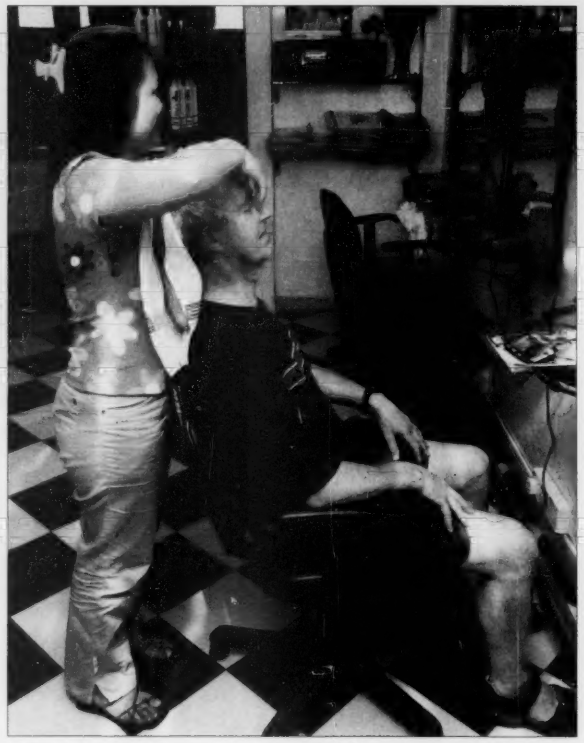

**Photo H.** *After the contest, Barry VK2BJ gets a relaxing massage at the local beauty parlor.*

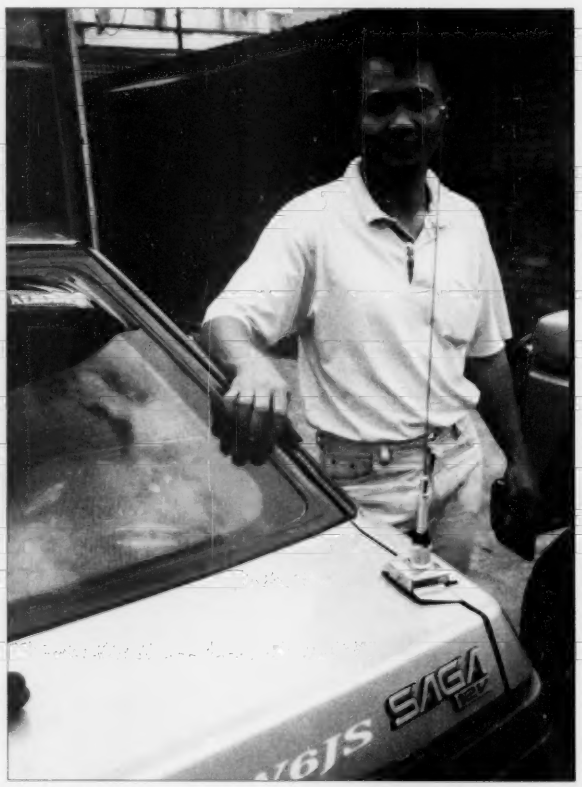


**Photo K.** *Another ham from Keningau — John 9W6JS.*

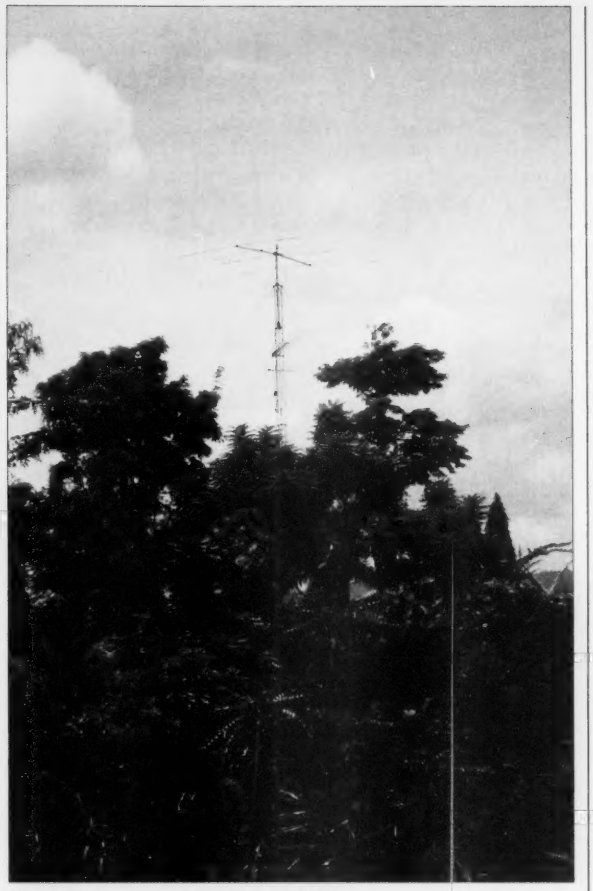

***Photo L.*** *Antenna of Dr. Elvin 9M6EL.*

here from Sydney, Australia, mainly for the Commonwealth Contest. When the contest was over, he E-mailed the logs to the QSL Manager Bob N2OO and the contest sponsor (**Photo G**). They have good facilities in Borneo and a good massage is available after a contest. I went to downtown Keningau, the nearest town to Hillview Gardens, with Barry, and he was treated to a relaxing half an hour in a beauty parlor (**Photo H**). The Hillview Gardens club is obviously very often on the air. Apart from paying guests there are a few local operators. Yani YBØUS from Jakarta looks after the antennas and the equipment, and of course spends much time on the air, sometimes as 9M6US. Phil 9M6CT, who moved from Hong Kong where he was VS6CT for years, is here. He now lives in Kota Kinabalu (**Photo I**) and often drops in to Hillview Gardens. There are other visitors, not so much welcome, like snakes that get tangled up in some antennas (**Photo J**).

The number of amateur radio operators is growing in Sabah. While we were looking for a component, Alfons 9M6MU introduced me to John 9W6JS (**Photo K**) in Keningau. Another active ham in this area is Elvin 9M6EL, who has a tall antenna tower on the outskirts of the town (**Photo L**).

There have been hundreds of amateur radio visitors from all over the world at Hillview Gardens and 9M6AAC since the grand opening in 1997. The Hillview Gardens club is a joint project with many people involved. Most of the equipment has been donated by individuals and companies. I strongly recommend visiting this place if you want to experience both exotic environment and equatorial propagation — not to mention the great hospitality of Doris and Alfons.

In Nov. 2001, the annual SEANET Convention took place in Sabah in cooperation with the Hillview Gardens ARC. 73

## NEVER SAY DIE

*continued from page 29*

genetically engineered ingredients, since 70% of our processed food now uses 'em.

### Housing Shortage

Proof #2,726,975 that the government makes a mess of everything it does is the housing shortage (translated: incredibly high home prices and rents) in San Mateo. The recent census showed that the housing supply there has grown half as fast as the population. Big surprise? Sure, with over two-thirds of the county off-limits for building anything. Naturally the "concerned citizens" are in favor of preserving both "open spaces" and "affordable housing."

We have the same kind of stupidity concentrated in state legislatures all around the country ... including a deadly concentration somewhere near Baltimore.

Open space preservation plus building height limits guarantee that more and more people will have to commute to work from an hour or so away. And we wonder about road rage on California's clogged freeways ... and their high traffic death toll.

The recent electric blackouts have almost caused some of the vigorous opponents to the building of generating plants in general, and nuclear plants in particular, to start thinking. Almost. No, hey, let's just put a ceiling on the electricity prices by law ... that'll keep prices low. It will also keep the supply low.

Well, if the electric companies can't supply low-cost electricity when they're not permitted to build new generating plants, let's have the government take them over. Yep, that's what we're hearing from environmental activists and some movie stars.

Why am I reminded of New York City's 34th Street convention center? Donald Trump offered to build it for $200 million, and to absorb any cost overruns. The city turned him down and did it themselves. The total cost was over $1 billion, and they forgot to build any parking space for visitors.

Then there's the billions in cost overruns on Boston's Big Dig, which are so astronomical that all anyone can do is laugh.

If Congress would remove the Post Office's monopoly on mail, experts have estimated that privatization would lower postal costs by at least 50%, and more likely 70%. If you want something done over budget, over schedule, and poorly, let the government do it. A visit to Russia gets that message home in a hurry.

### Lying?

If you're interested in the Flight 800 crash, check [http://worldnetdaily.com/news/article.asp?ARTICLE_id=26266], wherein someone on the deck of a Navy submarine very close to the crash site saw TWA 800 shot down.

*Continued on page 62*

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# Reverse Breakdown Voltage Measurement Adapter

*Build this simple project for your bench.*

*The circuit shown in* ***Fig. 1*** *is the schematic for a Reverse Breakdown Voltage Measurement Adapter. Many times it is necessary to determine the breakdown voltage of a semiconductor. A reverse-biased P-N junction conducts current when its reverse breakdown voltage is exceeded. For a regular diode, this is the same as the peak inverse voltage (PIV).*

Bipolar junction transistor reverse breakdown voltages can also be measured with this device. Furthermore, a zener diode's breakdown voltage can be measured. If the current through the device under test (DUT) is limited during reverse bias, the junction voltage drop remains relatively constant.

This design will test zener diodes from 5.1 V to 75 V. A multimeter set on DC volts is plugged into the unit along with the DUT.

Reverse breakdown voltage is read directly from the meter. When testing reverse bias diodes, a display of 5.1 V denotes a 5.1 V zener diode. Similarly, a display of 75 V represents a 75 V zener diode. When measuring these voltages, remember that the diodes usually have a ± 5% or ± 10% tolerance.

The zener diode voltage is dependent on the current through the device. The reverse breakdown voltage measurement adapter described here has a short-circuit test current of approximately 10 mA. If the rated operating current of the zener is greater than 10 mA, the measured zener voltage will be incorrect.

## Description

The reverse breakdown voltage

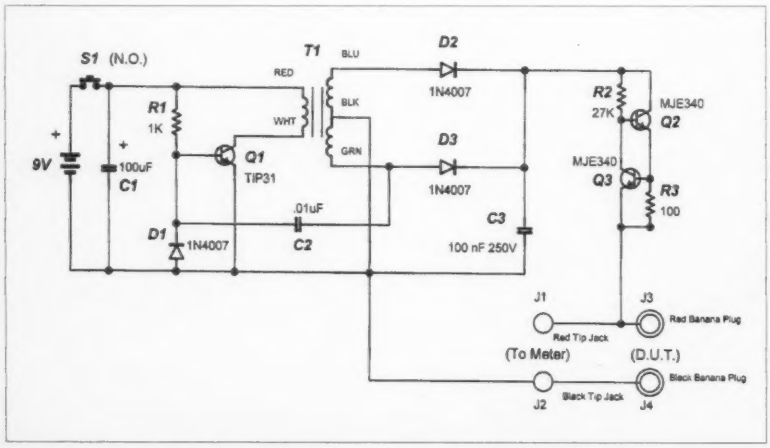


***Fig. 1.*** *Schematic of a Reverse Breakdown Voltage Measurement Adapter.*

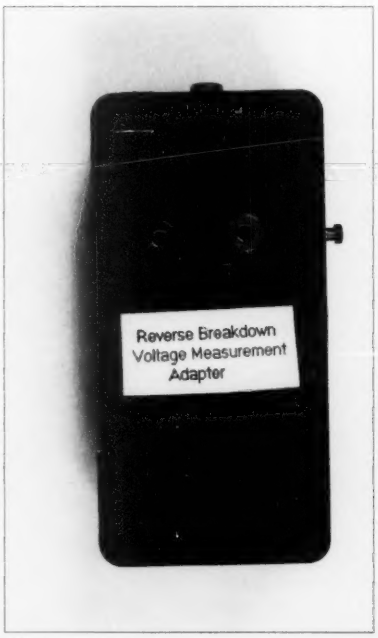


***Photo A.*** *Front view.*

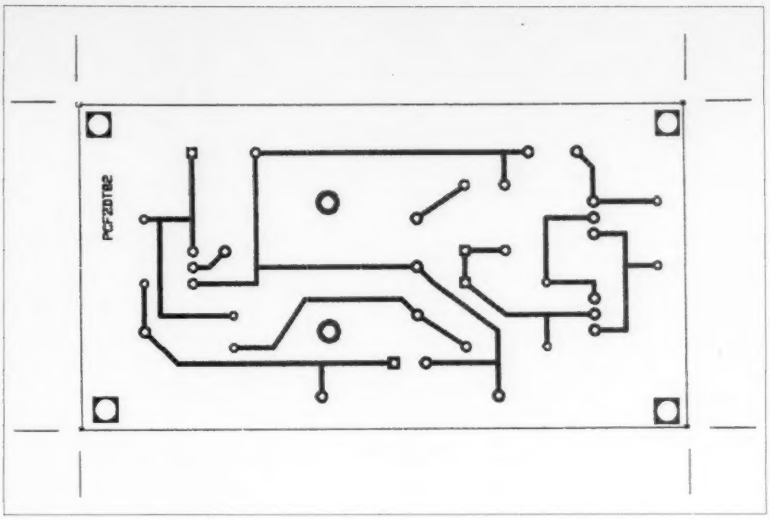


*Fig. 2. 1x PCB artwork.*

measurement adapter is composed of two basic parts. The first is a +125 VDC power supply. The second is a 10 mA current source that is connected from the +125 V to the DUT. The other terminal of the DUT is connected to ground. T1 is a 1k to 8 ohm audio transformer. This transformer is used in reverse (the 8 ohm winding drives the 1k winding instead of vice versa).

This allows T1 to generate +125 V at its 1k to center-tap winding. This center tap is connected to ground. The voltage at the green wire of T1 is 180 degrees out of phase with the red to white winding. The feedback drives the base of Q1 through C2. Q1 provides an additional 180 degrees of phase shift, causing a 360 degrees total phase shift along with a loop gain greater than 1.

This results in sustained oscillation (with some clipping). R1 is necessary to start the oscillator. D1 protects the base of Q1 from negative high voltages. D2 and D3 form a full-wave rectifier with

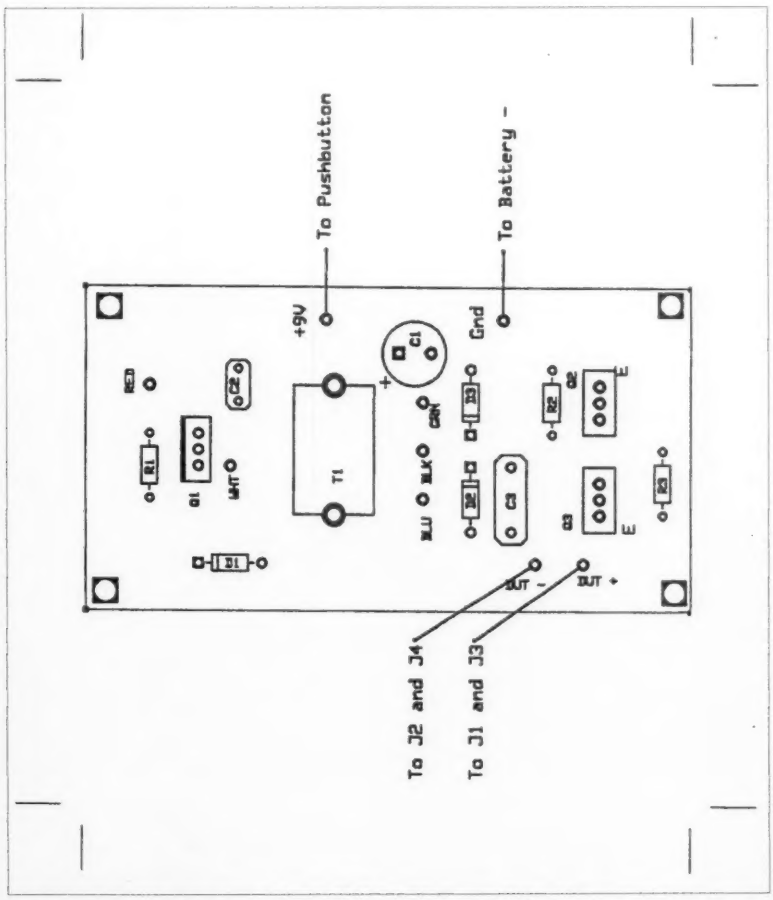


*Fig. 3. Component placement diagram.*

| Part | Description | P/N |
|---|---|---|
| R1 | 1k 1/4W 5% | |
| R2 | 27k 1/4W 5% | |
| R3 | 100Ω 1/4W 5% | |
| C1 | 100µF 35V electrolytic | |
| C2 | 10nF | |
| C3 | 100nF 250V film | |
| Q1 | TIP31 | |
| Q2, Q3 | MJE340 | Mouser 511-MJE340 |
| D1, D2, D3 | 1N4007 | |
| T1 | Audio transformer 1k CT to 8Ω | Radio Shack 273-1380 |
| S1 | N.O. push-button | |
| Case | | Radio Shack 270-1803 |
| Red tip jack | | Mouser 530-105-0802-1 |
| Black tip jack | | Mouser 530-105-0803-1 |
| Red banana jack | | |
| Black banana jack | | |
| 9V battery holder | | |
| 9V battery clip | | |
| 9V battery | | |
| 2-sided adhesive tape | | |
| Hookup wire | | |
| Black test cable | Black banana plug to alligator clip cable | |
| Red test cable | Red banana plug to alligator clip cable | |

***Table 1.** Parts list.*

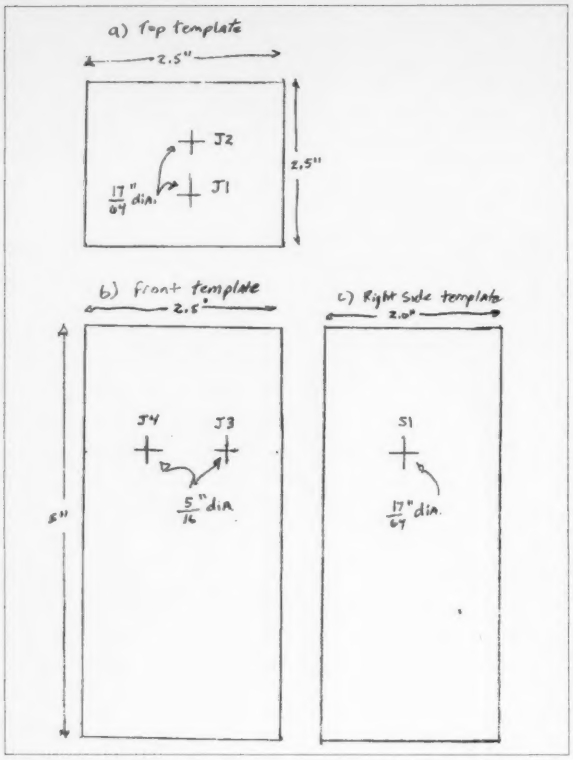


*Fig. 4. Drill template: (a) top template, (b) front template, (c) right side template.*

reference to T1's center tap. The output voltage of D2 and D3 is filtered by C3. Q2, Q3, R2, and R3 form a current source with a short circuit current of 10 mA. The current source allows the testing of reverse breakdown voltages without having to constantly change a series resistance for a given test current.

## Construction

**Fig. 2** shows the 1x printed circuit board (PCB) artwork for the tester. Component placement is given in **Fig. 3**. Part values are referenced in **Table 1**. First, install the resistors and diodes in the PCB. Then mount the capacitors and transistors. Note that Q2 and Q3 are facing opposite directions. For proper mounting, examine the pin designations of the MJE340 in **Fig. 5** and the emitter (E) marking in the component placement diagram in **Fig. 3**. After Q2 and Q3 are installed, mount the transformer to the circuit board by inserting T1's mounting tabs into the PCB and then bending them at right angles. Pads on the PCB are marked RED, WHT, BLU, BLK, and GRN (refer to **Fig. 3**). T1's color coded wires are soldered to each corresponding solder pad.

Obtain a 1x copy of the drill templates shown in **Fig. 4**. Cut them out and tape to the case. Next, mark the location of the holes with a punch. Remove the patterns and then drill the holes in the case as shown in **Fig. 4**. Solder six inches of red wire to J1 and six inches of black wire to J2. Then, mount these connectors in the appropriate holes in the case. Mount J3 and J4 to their holes in the lid. Examine **Fig. 3** for the connections of the test jacks. Solder the red wire attached to J1 to J3.

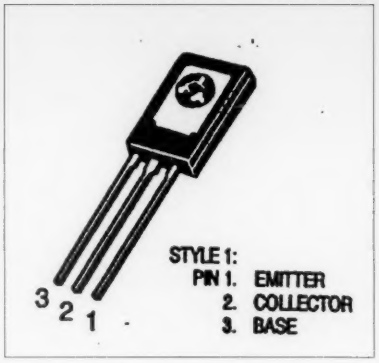


*Fig. 5. Transistor designations.*

Next, J3 is connected to the DUT + pad with a six-inch piece of hookup wire. Solder the black wire attached to J2 to J4. J4 is then connected to the DUT (–) pad of the circuit board with another short piece of wire. The +9 V pad is soldered to one terminal of the push-button switch S1, and the other terminal of the switch goes to the red wire of the 9 V battery snap. The black wire of the battery snap is attached to the GND pad of the circuit board. Finally, mount S1 to the case. The 9 V battery holder is attached to the reverse side of the lid near the lower part of the case with two-sided adhesive tape. Snap on the

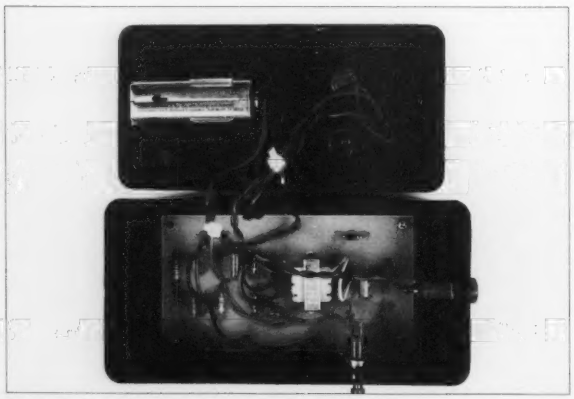

***Photo B.** Inside view.*

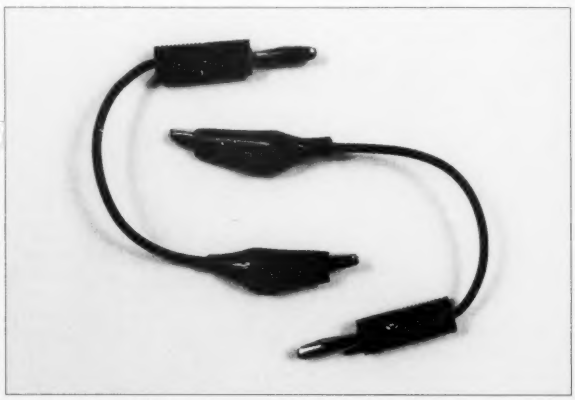

***Photo C.** Test leads.*

battery connector and install the battery into its holder.

### Testing

To improve safety, it is suggested that a resistor of 1 megohm be placed across capacitor C3 to function as a bleeder.

To test the circuit, attach a voltmeter across capacitor C3 and press S1. The meter should read approximately +125 V. If there is no voltage across C3, verify the correct attachment of T1's color-coded wires to their respective circuit board pads.

Also, check the correct installation of Q1 and D1.

Note: Because transformer color coding varies by manufacturer, proper phasing may be achieved by reversing a pair of colored leads, e.g., RED-WHT or BLU-GRN.

Once C1 has a charge of +125 V, the current source can be tested. Plug a voltmeter into J1 and J2.

To connect the DUT to the reverse breakdown voltage measurement adapter, either purchase or construct two test leads. One test lead has a red banana plug and alligator clip, while the other test lead has a black banana plug and alligator clip. Insert the red banana plug into J3 and insert the black banana plug into J4. Clip a 1k resistor between the alligator clips. After S1 is pressed, the meter should read between 8 V and 10 V.

This voltage drop corresponds to a current of 8 to 10 mA, thus verifying the operation of the current source. If the voltage drop is too high or is zero, there may be a problem with the correct installation of Q2, Q3, R2, and R3. Once the adapter is operational, mount the circuit board to the inside of the case using small self-tapping screws. Then attach the lid with the four screws provided with the case.

### Operation

Set the multimeter to read DC volts. Verify that the meter is plugged into the tip jacks, J1 and J2. Be sure that the banana plugs with alligator clips attached are plugged into J3 and J4.

To measure the breakdown voltage for a zener diode, attach the red alligator clip to the cathode (black band of the diode) and connect the black alligator clip to the anode.

Then press S1 and observe the meter. The zener voltage can be read directly from the meter. If the meter reads +125 V, then the reverse bias voltage is greater than this instrument can measure. This may occur if the DUT is not an actual zener diode, but a regular diode with a peak inverse voltage (PIV) greater than +125 V.

The unit will also measure forward voltage drops for any diode. In this case, the red clip is attached to the anode of the DUT and the black clip is attached to the cathode (black band). Pressing S1 will send 10 mA through the DUT, and the meter will show the forward bias voltage drop for the diode being tested.

This device can also be used to determine various properties of bipolar junction transistors (BJTs).

For NPN transistors, use the following instructions to measure the reverse breakdown voltages. In order to read the collector-emitter breakdown voltage (Vceo), clip the red test lead to the collector and the black test lead to the emitter of the BJT. When S1 is pressed, the collector-emitter breakdown voltage will be displayed.

To measure the emitter-base breakdown voltage (Vebo), clip the red lead to the emitter and the black lead to the base. Press S1 and read the result from the meter.

The collector-base breakdown voltage (Vcbo) can also be measured by connecting the red lead to the collector and the black lead to the base. Next, press S1 and examine the meter for the result. To determine the breakdown voltages for PNP transistors, measure similarly to the NPN transistors, except switch the polarity of the test leads.

Remember, the circuit can only measure reverse breakdown voltages of +125 V or less. Have fun building and operating the reverse breakdown voltage measurement adapter! 73

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9. W3HCW
10. KZ2W
11. K9FD
12. WD5N
13. KA9TNZ
14. K9GBN
15. N5GAP
16. WB3FMA
17. NN6E
18. AL7HG
19. N6CGB
20. KI6AN
21. K9JPI
22. N4WF
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24. KW7J
25. VE6JO
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49. KJ4RR
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51. N1EIU
52. K1DRN
53. WD8REC
54. ZL2BLC
55. VE3EFX
56. W9MCJ
57. N6IV
58. KN8D
59. KC5YQ
60. WB6ITM
61. KA2AOT
62. K4LHH
63. VE2QO
64. KE5AT
65. W9SU
66. W3OOU
67. NR2E
68. KF5PE
69. N3FBN
70. KB4SJD
71. N3EZX
72. IK8GCS
73. WB4I
74. NG1S
75. WB7UUE
76. HK4EB
77. KØBFR
78. N7GMT (KF7SH)
79. AA4VN
80. KA1LMR
81. N8AXA
82. NM2I
83. KD9YB
84. HC2CG
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89. 5Z4BF
90. IØAOF
91. VE1BN
92. KA2NRR
93. 5Z4DU
94. KB8ZM
95. HK4CCW
96. W2JQ
97. HC2AGT
98. WD5N/M
99. VE1BHR
100. VE1AGZ
101. K5AOB
102. KW2D
103. PY3ARZ
104. WB4ETD
105. N2FPB
106. KD3CQ
107. K4NNK
108. VU2DNR
109. AA5BE
110. PY3OG
111. VE4ACF
112. VE4SI
113. PJ2KI
114. WB4CKY
115. W6EQB
116. KK4IY
117. IK1IYU
118. N6GCN
119. KB1AF
120. KB8BHE
121. KE2CG
122. VS6CT
123. G3IZQ/W
124. WB6FNI
125. KAØIAR
126. K9SM
127. W6BCQ
128. KA5MSL
129. WB4FLB
130. N7GLT
131. WAØX
132. KF4GW
133. N4QGH
134. VE1CBK
135. 7J1AAL
136. K6ICS
137. NZ7W
138. WBØN
139. WC7F
140. F6IFE
141. KL7N
142. KE8LM
143. WA6YOO
144. VE2MFD
145. N3APQ
146. HK1DBO
147. NM3V
148. IK6GFY
149. WB6UAN/M
150. NK6Z
151. KB6IUA
152. W9OKH
153. WB5FXT
154. NB3E
155. N2ESP
156. YU2EJU
157. OZ1DXX
158. IK5IIU
159. KA1ION
160. KD3AI
161. OK1AEH
162. W9LCR
163. 8P6SH
164. KA6SPQ
165. ZF2KH
166. W6MVV
167. JA8CAQ
168. KI6WF
169. K2MRB
170. AA6GM
171. JAØSU
172. NU8Z
173. GØGRK
174. YB8VM
175. DV1BRM
176. WØTU
177. N7CNH
178. PY3IO
179. YBØZCA
180. YBØAF
181. VE3PQB
182. W2SV
183. N1ADE
184. WP4AFA
185. KS7V
186. W2OFB
187. G4ASL
188. N5JUW
189. KA8WAS
190. 5NØWRE
191. AA4IP
192. JR5KDR
193. KD2WQ
194. KA3NIL
195. WA8YWK
196. VE1ACK
197. HP2XVB
198. WB5KYK
199. N5JUJ
200. N4OBJ
201. 9Q5NW
202. KW2D
203. VE1HA
204. HP8BSZ
205. IK8JJQ
206. YC3DKN
207. I3VKW
208. K2EWA
209. KD3CR
210. N9GDG
211. KF8K
212. FD1BEG
213. DU1DZA
214. N8IMZ
215. KK4YA
216. LU1JDL
217. KA8YYZ
218. KA4TMJ
219. WA9DDC
220. YI1CIS
221. YC3FNL
222. GØFWG
223. KV4B
224. N5IET
225. WA9WIG
226. N3CDA
227. KE6KT
228. IK7DBB
229. JY5EC
230. N1ETT
231. PY2DBU
232. I8IYW
233. NØISL
234. KC4BEB
235. WA7QQI
236. KA1RJG
237. OZ9BX
238. KB4HBH
239. KA3RWP
240. NJ1T
241. W4DCG
242. YCØRX
243. VE7OJ
244. AA4W
245. N9GMM
246. KB4HBH
247. KM4HF
248. CE1YI
249. KA1FVY
250. N2GVB
251. N2DAO
252. WF8E
253. YBØHZL
254. N5MBD
255. N4SNS
256. KA3TGY
257. JN3XLY
258. N4DUV
259. KA9MRU
260. KA4OTB
261. N4JED
262. AB4KA
263. WA7OET
264. KA3RVH
265. CE7ZK
266. NI9J
267. WB9PTN
268. KB8DAE
269. WØCL
270. WB7VUB
271. JF6TUU
272. ZY3IO
273. KB4VIR
274. OE6CLD
275. N7JJQ/DU3
276. KK4FB
277. DU1AUJ
278. K2EWB
279. NI5D
280. N2JXC
281. NØIWT
282. WB3BDH
283. K1CVF
284. KA3CXG
285. KA1SPO
286. WA4NWT
287. KJ4OI
288. KA3UNQ
289. WB2VMV
290. KD4MM
291. OE3DHS
292. KD9HT
293. DL8OBC
294. G3KVA
295. WA4NEL
296. KA4VZO
297. NØIDT
298. KA1FUE
299. KD7EO
300. JH8MWW
301. KB8ICD
302. JA1CKE
303. N3GEE
304. JA5MG
305. KA1FTU
306. WA8KMK
307. N2IBW
308. N4THE
309. N3CYD
310. JA4TF
311. W6YLL
312. WA1S
313. KC5WA
314. N6WK
315. PY4OY
316. KG7BO
317. WB3FQY
318. WCØA
319. VE4AMU
320. YCØMCA
321. WA3LEU
322. KB2GLO
323. OZ1FNX
324. K6GCF
325. KC4PCX
326. KA7EXD
327. DK9EA
328. HL5AP
329. SM7BRO
330. ON6DP
331. WA3KKO
332. KB9ABI
333. DA2UI
334. SMØBNK
335. WA2BMQ
336. WAØQIT
337. 5Z4BH
338. KB9ALG
339. OA4ANR
340. OD5ZZ
341. VE3ZD
342. LU2ATR
343. HL5FRG
344. UB5LRS
345. N1ICC
346. UY5XE
347. PS7AB
348. IK4NPC
349. KD1CT
350. DU1CHD
351. UB4WZA
352. LU3CF
353. G7AZP
354. VE5AAD
355. IK3ITX
356. SM4SEF

357. N9CPK
358. VE2JWK
359. N7JXS
360. KO4VO
361. JE1GWO
362. JM2DRM
363. IK1SLE
364. JF7QUE
365. HL5BUV
366. VE3GLX
367. N7QXQ
368. JE6KLR
369. KK6JY
370. N2BI
371. KK4XL
372. JA3SSB
373. KBØADI
374. I1-50156
375. VU2SMN
376. EA6AAK
377. N3IHS
378. N8MOT
379. KB2NEK
380. PY2DBU
381. WA2CKP
382. WB2PPN
383. JA1-2Ø762/BV
384. AB4ZD
385. YC8EMH
386. WA8RLB
387. N5VWM
388. VE7SKB
389. KB4BCC
390. VE7GSE
391. YC8BWN
392. KN6ER
393. KD1CJ
394. G2BFO
395. KB7ROK
396. VK2EQ
397. 4X4-2175
398. JE1BGL
399. KF2LC
400. WV2X
401. LU5EWO
402. WAØCLR
403. VO1UL
404. VE6AML
405. WD4REX
406. WAØCLR
407. VE3VJC
408. WA1MKS
409. JH6FHJ
410. JE9EMA
411. WK8X
412. TI2YLL
413. KP4WN
414. KD6MOS
415. KI7CM
416. JH1IED
417. JN6MIC
418. BU7FC
419. DL1EMO
420. KD4TWP
421. 5W1GC
422. JA7JI
423. W5RUK
424. LU3OJZ
425. WD4OHD
426. 7L1MFS
427. ON4BCM
428. WØUHL
429. N4WJV
430. LU5DSE
431. HS1NGR
432. DU1SAN
433. 4X/G3WQU
434. K3BSA
435. CP8AK
436. K8IHQ
437. JA7NUZ
438. HL5FXP
439. N9PM
440. K9UQN
441. WA7SNY
442. HL5YAW
443. DS5WQT
444. JH7GZF
445. K6CIL
446. JK1QJE
447. WA8NPX
448. WA9MTP
449. DK6AP
450. DK6YY
451. JA3BKP
452. JA8HIO
453. JH1REP
454. W9HBF
455. N9GM

**150 COUNTRIES ENDORSEMENT**

1. WB2DIN
2. N4WF
3. N6GCB
4. K9FD
5. NØAFW
6. N3II
7. WB1BVQ
8. KA2AOT
9. KI6G1
10. N7GMT
11. IK8GCS
12. IK1APP
13. VE6JO
14. VE4ACF
15. WB4I
16. IK1IYU
17. KE2CG
18. G3IZQ/W1
19. WB6FNI
20. K8MDU
21. VE6VK
22. KB6IUA
23. WB5FXT
24. YU2EJU
25. IK5IIU
26. KE8LM
27. KA1ION
28. KA6SPQ
29. W6MVV
30. JA8CAQ
31. KI6WF
32. JAØSU
33. WD5N
34. W2SV
35. W6BCQ
36. F6IFE
37. VE2MFD
38. WP4AFA
39. 5NØWRE
40. KD2WQ
41. VE1ACK
42. N5JUJ
43. 9Q5NW
44. KB8BHE
45. I3VKW
46. KD3CR
47. N8IMZ
48. GØFWG
49. N2FPB
50. KE6KT
51. OZ9BX
52. NJ1T
53. CE1YI
54. YBØHZL
55. JN3XLY
56. KA9MRU
57. CE7ZK
58. KB8DAE
59. K2EWB
60. NI5D
61. KD3CQ
62. KA4OTB
63. WB2VMV
64. KD4MM
65. KD9HT
66. KA3NIL
67. NØ1DT
68. KA1TFU
69. KA4TMJ
70. JA4TF
71. KA3UNQ
72. KB8ZM
73. K2EWA
74. WA1S
75. PY4OY
76. WCØA
77. OZ1FNX
78. KA7EXD
79. ON6DP
80. VE1RJ
81–89. Omitted
90. N6WK
91. WA3KKO
92. KB9ABI
93. SMØBNK
94. WAØQIT
95. 5Z4BH
96. OA4ANR
97. OD5ZZ
98. VE3ZD
99. HL5FRG
100. UB5LRS
101. PS7AB
102. KD1CT
103. DU1CHD
105. IK3ITX
106. VE2JWK
107. N7JXS
108. JM2PRM
109. HL5BUV
110. VE3GLX
111. KK6JY
112. EA6AAK
113. N3IHS
114. WA2CKP
115. VE6AML
116. WAØCLR
117. WA1MKS
118. KD6MOS
119. KP4WN
120. LU5EWO
121. 5W1GC
122. JA7JI
123. W5RUK
124. LU3OJZ
125. ON4BCM
126. WØUHL
127. N4WJV
128. LU5DSE
129. VO1UL
130. DU1SAN
131. 4X/G3WQU
132. K8IHQ
133. K9UQN
134. WA7SNY
135. HL5YAW
136. K6CIL
137. WA8NPX
138. WA9MTP
139. JA8HIO
140. N9GM

**200 COUNTRIES ENDORSEMENT**

1. N3II
2. WB2DIN
3. K9FD
4. IK8GCS
5. NØAFW
6. WB1BVQ
7. VE4ACF
8. KI6GI
9. N6GCB
10. K8MDU
11. YU2EJU
12. KE8LM
13. WD5N
14. F6IFE
15. 5NØWRE
16. KE2CG
17. I3VKW
18. CE1YI
19. W6BCQ
20. CE7ZK
21. KB8DAE
22. K2EWB
23. KD3CQ
24. KD4MM
25. KD9HT
26. KA4TMJ
27. N7GMT
28. JA4TF
29. K2EWA
30. WA1S
31. PY4OY
32. ON6DP
33. VE1RJ
34. WA3KKO
35. WAØQIT
36. 5Z4BH
37. HL5FRG
38. JA1-2Ø762/BV
39. VE6AML
40. LU5EWO
41. 5W1GC
42. JA7JI
43. W5RUK
44. LU3OJZ
45. WØUHL
46. N4WJV
47. VO1UL
48. DU1SAN
49. K8IHQ
50. K9UQN
51. WA7SNY
52. N9GM

**250 COUNTRIES ENDORSEMENT**

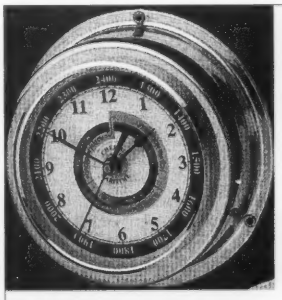
1. WB2DIN
2. IK8GCS
3. WD5N
4. K8MDU
5. KE2CG
6. CE1YI
7. CE7ZK
8. K2EWB
9. KD9HT
10. N7GMT
11. KD3CQ
12. KB8DAE
13. WA1S
14. PY4OY
15. VE1RJ
16. 5Z4BH
17. N2BI
18. I75OI56
19. VE6AML
20. KB8ZM
21. LU5EWO
22. JA7JI
23. W5RUK
24. WØUHL
25. K9UQN
26. N9GM

**300 COUNTRIES ENDORSEMENT**

1. WB2DIN
2. IK8GCS
3. K2EWB
4. K8MDU
5. N7GMT
6. WA1S
7. PY4OY
8. KD3CQ
9. VE1RJ
10. UY5XE
11. IK3ITX
12. VU2SMN
13. JA7JI
14. W5RUK
15. LU5EWO
16. WB2VMV

**350 COUNTRIES ENDORSEMENT**

1. WB2DIN
2. PY4OY
3. UB4WZA
4. JA7JI
5. KD3CQ

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# CALENDAR EVENTS

*Listings are free of charge as space permits. Please send us your Calendar Event two months in advance of the issue you want it to appear in. For example, if you want it to appear in the September issue, we should receive it by June 30. Provide a clear, concise summary of the essential details about your Calendar Event.*

**JUN 1**

**QUEENS, NY** The Hall of Science ARC Hamfest will be held at the New York Hall of Science parking lot, Flushing Meadow Corona Park, 47-01 111th St., Queens NY. Doors open for vendors to setup at 7:30 a.m. Buyers admitted at 9 a.m. Free parking. Door prizes, food and refreshments. VE exams at 10 a.m. For VE info contact L*enny Menna W2LJM* by calling *718-323-3464*, or E-mail *[LMenna6568@aol.com]*. Admission by donation: buyers $5, sellers $10 per space. Talk-in on 444.200 rptr. PL 136.5, and 146.52 simplex. Visit the Web site at *[www.qsl.net/hosarc]*. For more info call at night only, *Stephen Greenbaum WB2KDG, 718-898-5599*. E-mail *[WB2KDG@arrl.net]*.

**JUNE 7**

**BANGOR, ME** Bangor Hamfest at Hermon High School, Hermon, Me. Time: 8 a.m. to 1 p.m. Admission, $5.00. Tailgaters, $5.00. dm. Directions: Interstate 95 to Exit 44 North to Rte #2, left on Rte #2 West for 1-1/2 miles to High School. From Newport, East on Rte #2 to Hermon Corner, then 1/2 mile east on Rte #2 to High School. Talk-in Freq. 146.34/94. Simplex 146.52. Grand Prize drawing At NOON. Must be present to win. Programs: ATV, APRS, ARES/RACES DEMO, TRAFFIC HANDLING, PSK 31, VINTAGE RADIO, ECHO LINK, FOX HUNT, GEOCACHING. Club Web site: [www.n1me.com]. Contact Person: *Roger W. Dole, 207-848-3846;* E-mail: *[rdole@hermon.net]*.

**WINSTON-SALEM, NC** Setup Fri. night or 6 a.m. Sat.; gates open 6 a.m. to 1 p.m. Sponsor: Forsyth Amateur Radio Club. Dixie Classic Fairgrounds; I-40 to US52 to Akron Dr. ,follow signs to fairgrounds, enter Gate 5 off Deacon Blvd. Fleamarket, tailgating, VE Session. Camping hookups available for Friday night. Talk-In: 146.64 (145.47 B/U). Admission: $5.00; tables: $15.00. *Raymond Taber KG4NTC, 336-786-8241* or *336-723-7388*. E-mail for info: *[kg4ntc@yahoo.com]*. General info: *[http://www.w4nc.com]*.

**JUNE 8**

**WHEATON, IL** The Six Meter Club of Chicago Inc. will hold its 46th Annual ARRL sponsored Hamfest on Sunday, June 8th. This is an all-weather location at the DuPage County Fairgrounds, Wheaton IL, west of Chicago, at 2015 Manchester Rd., north of Roosevelt Rd. (Rte. 38), east of County Farm Rd. Free parking with no extra charge for outdoor flea market space. Donation Auction at 11 a.m., proceeds to ARCI (Radios, test equipment, parts only, no PCs). Overnight RV parking with 110 VAC hookup, advance registration required. Tickets are $5 in advance, $7 at the gate. Advance tickets are available from *Six Meter Club of Chicago, 7109 Blackburn Ave., Downers Grove IL 60516*, or any club member. For more info call the 24-hour InfoLine at *708-442-4961*, or see the Web site at *[www.qsl.net/K9ONA]*. E-mail *[WA9RIJ@mc.net]*. General parking is at the west gate. Sellers only at the east gate. Handicap parking at the east gate. Gates open at 7 a.m. Buildings open to the public at 8 a.m. Talk-in on K9ONA 146.52, K9ONA/R 146.37/.97 (107.2 Hz). ARRL VE Exams 9 a.m. to 11 a.m. — call the InfoLine to pre-register for testing. This event will also feature ARRL, AMSAT and dealer displays. Absolutely no alcoholic beverages permitted. No sale of food or beverages in the flea market. All sellers responsible for cleanup of their spaces!

**JUNE 13, 14**

**KNOXVILLE, TN** The Radio Amateur Club of Knoxville will sponsor its 37th Knoxville Hamfest and Electronics Exposition on June 14th at the Cokesbury Conference Center, 9915 Kingston Pike, Knoxville TN, from 9 a.m. to 4 p.m. ET. General admission is $6. There will be a special Electronics Exposition and "Sneak Preview" on Friday evening, June 13th, from 6 p.m. to 9 p.m. ET. Admission for Friday activities is by advance hamfest ticket purchase only. The advance hamfest ticket package is $10 and includes admission tickets for both Friday and Saturday events, plus one free tailgate space. On Saturday, inside dealer tables will be available for $15 each (8 ft. x 30 in.) and the inside facility is air conditioned and carpeted. Outside tailgating is $5 per space plus a $6 admission. The Hamfest will feature forums and clinics on Digital RF Communications, Antennas, CW Operating, The Sun and Solar Activity, Amateur Radio Basics for New Hams, Emergency Communications and Amateur Radio, and a special FCC Forum by Bill Cross W3TN from the FCC in Washington DC. VE exams will be given at 2 p.m. ET with advance registration at 1:30 p.m. Other activities will include amateur radio demonstrations and exhibits plus a large free product literature area. Concessions are on site. Parking is free and there is handicap access. Talk-in on 147.300, 224.500 and 444.575 linked repeaters plus 53.770 rptr. The Web site is at *[www.W4BBB.org]*. The Radio Amateur Club of Knoxville is also celebrating its 50th Anniversary at the hamfest, and special activities are planned to celebrate this anniversary. For more info contact *Radio Amateur Club of Knoxville, P.O. Box 50514, Knoxville TN 37950-0514*. E-mail *[d.bower@ieee.org]*, or call *865-670-1503*.

**MIDLAND, MI** The Midland Amateur Radio Club (M.A.R.C.) will sponsor its 26th annual Hamfest on Saturday June 14, 2003, from 8:00 a.m. until 1:00 p.m. at the Midland County Fairgrounds. Admission is $4.00 per person, advanced table reservations are available for $6.00 per 8 foot section, and trunk sale space for $5.00 per space plus admission. FCC exams will be administered, food will be available. (Friday night camping is available on the fairgrounds.) Location: Gerstacker Fair Center on the Midland County Fairgrounds. Use Entrance off Airport Road. For further information and table reservations: *M.A.R.C. Hamfest, P.O. Box 1049, Midland MI 48641-1049*, or *Bill AB8JF, 989-835-5562*, or E-mail: *[ab8jf@arrl.net]*. Also: *Lee KC8ITI, 989-652-6213*.

**MONUMENT, CO** Pikes Peak Amateur Association Swapfest will be held on June 14, 2003, at the Lewis-Palmer High School, 1300 Higby Road, Monument, Colorado (just east of I-25 between exits 158 and 161). Prizes include Yaesu FT-817, Yaesu 8900R, Yaesu VX-1R. Forums, VE session, junk auction. Admission is $5.00. Contact *Dennis NØABC , n0abc@arrl.net*. Additional information: *Kate Muniz, kcegi@aol.com*. Doors open 8:00 a.m. (0600 for sellers).

**JUNE 15**

**CROWN POINT, IN** The Dad's Day Hamfest and Computer Show, sponsored by the Lake County ARC, will be held at the Lake County Fairgrounds, 889 S. Court St. in Crown Point, starting at 8 a.m. June 15th. Talk-in on 147.00 PL 131.8 rptr, or 145.52 simplex. Setup for vendors is at 6 a.m. This event is totally indoors and features commercial vendors, indoor flea

market, food and beverages, and walk-in VE exams. You can find more info at *[http://www.qsl.net/w9ljj];* or contact *Lee* via E-mail at *[leeraue@msn.com];* or *Rich* at *[paris156@yahoo.com].*

**JUNE 21**

**PISCATAWAY, NJ** W2QW, the Raritan Valley Radio Club, will hold "Hamfest 2003" at Piscataway NJ High School (NEW LOCATION), near intersection of Old New Brunswick and Behmer Roads. Sellers 6:00 a.m., Buyers 7:00 a.m. - 2:00 p.m. Admission: Buyers $5.00, Sellers $5.00 ($5.00 each additional space). Talk-in 146.625(r), 447.250(r), tone 141.3, 146.520(s). Contact person: *Marty Ficke KD2QK@aol.com, 725-968-6911, or Fred Werner KB2HZO, 732-968-7789 before 8 p.m. Raritan Valley Radio Club W2QW Web site: [www.w2qw.org].*

**JUNE 28**

**HASTINGS, MI** The Barry Amateur Radio Assn. Ham Radio and Computer Swap will be held at Charlton Park, 2545 S. Charlton Park Rd., Hastings MI, 8 a.m. to 12 noon. Admission 12 years and up is $5. Trunk sales spaces $5. Indoor spaces $10 each. Talk-in on 146.46 FM. Vendor info E-mail to *[field_day_swap 2003@yahoo.com],* or write to *Jack K8YPW, P.O. Box 370, Hastings MI 49058.* For VE exam info E-mail *Pete N8ZSG* at *[peted@msgexp.net].*

**JULY 12**

**OAK CREEK, WI** The South Milwaukee ARC Inc. will hold its 36th annual Swapfest on Saturday, July 12th, at the American Legion Post #434 grounds, 9327 S. Shepard Ave., starting at 6:30 a.m. and running until at least 2 p.m. CDT. Free parking, a picnic area, and limited free overnight camping are available. Hot and cold beverages, donuts and sandwiches will also be available starting at 6 a.m. Admission is $5 per person. Prizes will be awarded during the day and you need not be present to win. A free flyer and map may be had by writing to *The South Milwaukee ARC Inc., P.O. Box 102, South Milwaukee WI 53172-0102.* Talk-in will be on 146.52 (WA9TXE) simplex as well as on many of the local repeaters.

**JULY 13**

**KIMBERTON, PA** The Mid-Atlantic ARC will present their annual Valley Forge Hamfest and Computer Fair, Sunday, July 13th, at the Kimberton PA Fire Company Fairgrounds, Route 113, south of the intersection with Route 23. This ARRL sanctioned Hamfest will be held rain or shine. Sellers admitted at 7 a.m. and buyers admitted at 8 a.m. Admission is $6. Unlicensed spouse and children of licensed amateur radio operator will be admitted free of charge. Lots of great door prizes will be available. Many dealers will be there selling amateur radio and computer gear. Demonstrations will also be featured. For inside tables w/elec., E-mail *Rick Miskinis N3AGS* at *[reservations@marc-radio.org],* or call him at *610-825-9590.* Indoor tables are $10 each for 1 to 4 tables, $8 each for 5 or more, in addition to admission. Outdoor tailgate space $6 per space in addition to admission (not available in advance). Food and beverage sales are to be done by authorized vendors only. For more info please E-mail MARC at *[Hamfest-info@marc-radio.org],* or write to *MARC, P.O. Box 2154, Southeastern PA 19399-2154.* Info is also available on the club Web site at *[http://www.marc-radio.org].* Talk-in on 146.835(-) MHz and 443.800(+) MHz PL 131.8. Watch for signs directing you to the site.

**JULY 18, 19**

**OKLAHOMA CITY, OK** The Central Oklahoma Radio Amateurs will sponsor its 30th annual "Ham Holiday 2003" at the Oklahoma State Fair Park, northeast of the I-40 and I-44 intersection, in the Made In Oklahoma building. Doors open 5 p.m. to 8 p.m. Friday, July 18th; 8 a.m. to 5 p.m. Saturday, July 19th. Features: Technical and non technical programs, WAS card check, VE exams, flea market. Pre-registration is $7, $10 at the door. Advance flea market tables are $15, $20 per table at the door (if available). Electrical hookup $10. People under 16 years of age are admitted free if accompanied by an adult. Talk-in on 146.82. Additional info and registration forms are available on the CORA Web site at *[www.qsl.net/coranews].* Vendors, E-mail *[kc5qcv@cox.net]* for details. Send pre-registration to *CORA Ham Holiday 2003, P.O. 265, Ft. Supply OK 73841-0265.*

**JULY 19**

**CARY, NC** An ARRL sanctioned "Mid-Summer Swapfest" will be held by the Cary ARC, July 19th, 8 a.m. to 2+ p.m. at the Herbert Young Community Center, Academy St. and Chapel Hill Rd. Talk-in on 145.39-.6. The event is indoors and air-conditioned. Tickets $4 in advance and $5 at the door. VE exams registration at 10 a.m. Testing starts at 11 a.m. Walk-ins OK. E-mail to *[n4nc@arrl.net],* or see the Web site at *[www.qsl.net/n4nc/]* for more info.

**JULY 20**

**SUGAR GROVE, IL** The Fox River Radio League of Batavia IL, will hold their Annual Hamfest at Waubonsee Community College, Rte. 47 at Waubonsee Dr. in Sugar Grove (5 miles NW of Aurora). Talk-in on 147.210(+) PL 103.5/107.2. Doors open Sunday at 8 a.m. Setup is 7 p.m. on Saturday and 6 a.m. to 8 a.m. on Sunday. VE exams start at 10 a.m., bring original license, copy of license and photo ID. Contact *Maurice L. Schietecatte W9CEO, c/o FRRL, P.O. Box 673, Batavia IL 60510.* Phone *815-786-2860,* or E-mail to *[scat42@msn.com].* The Web site is at *[http://www.frrl.org].*

**WASHINGTON, MO** The 41st Annual Zero Beaters ARC Hamfest will be held July 20th, 6 a.m. to 2 p.m. at Bernie E. Hillerman Park in Washington MO. Free parking and free admission. Sandwiches, brauts, refreshments and desserts will be available. Features: Commercial vendors, bingo, ham radio and computer flea market, technical sessions and ham radio demonstrations. Additional info and talk-in on 147.24(+) rptr. Watch for green on white hamfest signs. Registration for VE exams starts at 9 a.m. Walk-ins welcome: limit 30. Bring original license and a photocopy. For exam info SASE to *ZBARC VE Exam, P.O. Box 1305, Washington MO 63090.* For hamfest info, contact *Zero Beaters ARC, P.O. Box 1305, Washington MO 63090;* or *Keith Wilson KØZH* days at *636-629-7368; fax 636-629-0103.*

**JULY 26**

**CINCINNATI, OH** West Side - Saturday, July 26, 2002, Flea market 6 a.m. - 1 p.m. Air-conditioned inside vendor area 8 a.m. - 1 p.m. Sponsor: OH KY IN Amateur Radio Society. Location: Diamond Oaks Career Development Campus, 6375 Harrison Avenue, Cincinnati, OH (handicapped accessible). This large facility is located just east of I-275 and I-74. Take I-74 to the Rybolt Road/Harrison Avenue Exit (Exit #11). Go east on Harrison Avenue. Diamond Oaks is located on the right (south side) of Harrison Avenue, less that one mile from the I-74 exit. Special seminars, transmitter hunts, indoor vendors, large outdoor flea market, door prizes, VE exams (8 a.m., walk-ins accepted), refreshments, free parking, handicapped parking available. ARRL-approved! Talk-in: 146.670(-) repeater. Admission: Adv. $5, gate $6., age 12 and under free. Indoor vendor tables (6 ft. with free electricity) $10 ea. Outdoor flea market, $1 per space. *Contact Lynn Ernst WD8JAW, 10650 Aspen Place, Union KY 41091-7665; 859-657-6161, E-mail [wd8jaw@arrl.net]. Web: [www.ohkyin.org].*

**SWANSEA, MA** The Fall River MA Amateur Radio Club will hold its annual Geek-fest, clam-boil, and flea market, Saturday, July 26th, at American Legion Post 303, Ocean Grove Ave., Swansea MA. For more info contact George KB*1CNA* at *[kb1cna@msn.com]; Skip KB1CNB* at *[kb1cnb@arrl.net;* or *Roland N1JOY* at *[n1joy@arrl.net].*

**JULY 27**

**TIMONIUM, MD** The Baltimore Radio Amateur

*Continued on page 59*

# THE DIGITAL PORT

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# Linux Cont., Plus Some Digital Basics

*Those of you who have been following the Linux saga have noticed I gave it a breather for a time. Quite a few of you have responded favorably to the project. I left off after successfully getting the Red Hat 8 distribution up and running in the little cheapo box along with KPSK up and on the air, and worked a few stations.*

I was highly elated, but had to get back to some of those things that were not quite so off the wall, at least for a time. It was also necessary to make some minor hardware placement adjustments. One kind ham sent me a message concerning a very nice little package to combine the two CPUs using one monitor, keyboard, and mouse. It is the Belkin KVM system.

Not being familiar with this hardware, I was surprised when, during a subsequent visit to the local Office Depot, the system was displayed for all the world to inspect and purchase. I don't know if I would ever have noticed its existence if not for the gentle offerings afforded in the message from the ham. Sometimes we are blind to answers sitting in plain sight.

I have since made a small modification to the clutter caused by too much hardware. I found an inexpensive extension cable for the monitor which allows better placement of the hardware. It is nice to have somewhere to wiggle your legs while you work.

Some other happenings along the way include attempting to set up Win98se on the same hard drive. That seemed to almost be a success except for lack of a compatible driver for the monitor to go along with this slightly offbeat hardware. Sometimes, it is difficult to believe the strange incompatibilities experienced since beginning this project.

However, the need for the Windows on the same hard drive became less pressing and that has slid further toward the back burner. Some of the needs to make this little machine do everything have been solved by other means. One of those was getting a new laptop, which we will discuss in a future column.

So, back to the current and more exciting adventure. In the process of installing the Windows on this hard drive, I lost the KPSK installation that I had worked so diligently to compile in the last Linux article. This was not so bad because it gave good reason to try a fresh approach to setting up KPSK by simply downloading an RPM file and installing it as an update.

Very slick indeed. Virtually nothing to the process. All I did in this case was go to the download site which was at SourceForge, and download it for the Red Hat 8 distribution. One thing I have to say about this is that the system certainly "knew" its way around. The download automatically went to the Red Hat Linux Home Directory that is default for all downloads.

Next step was simply to double-click the file, and a window popped up explaining the "update" process and it took care of it from there. All I had to do to see that it was installed was simply type in KPSK in the terminal window and the program booted. Another kindly ham had informed me of this process after I had struggled through the entire compiling process previously. Again, the price of education leaves its impressions.

By the way, I have started this month's article using the OpenOffice word processor that came with the Red Hat distribution. It was necessary to specify that it be installed since it was not an item that would have been automatically included in the install.

If you have need for and appreciate a first-rate word processor, this is one you will like. As far as I can see, you can use it for anything you are apt to create, including a full-fledged book with footnotes, bibliography, and index. And one little aside: It is free.

## More fun

I had mentioned a while back how I would like to find a full-fledged Linux log program. I did quite a bit of searching and, truthfully, I found that there are several. Due to some of my as-yet-not-too-well-developed ability to follow instructions (and, perhaps, just a few system incompatibilities), some programs did not pan out well.

However, I came upon a real winner. At least, judging by the ease of installation, I came up with one that really does the job. It is called, simply, "xlog" and there is a screen shot showing some of the results of the labor here in the shack. It can be downloaded from [http://people.debian.org/~pa3aba/xlog.html].

This program was also an easy install. The downloaded file was in .rpm format and did not require any compiling. Very easy and intuitive to use. The data for your QSOs is saved in ADIF format. I assumed that meant I could import an ADIF file, but I could not seem to accomplish that small bit of wizardry. Other than that, it does what you expect. See **Fig. 1.**

## Back to Microsoft with this text

This may not strike you as the high point of the article, but this is where I transferred the article from one computer to the other. It was perfectly intact, but formatting had suffered and, for some unknown reason, when I got it into WordPerfect, the spell checker insisted the text was written in German! A few handsprings later and it was working.

Such is education. I can guess how this happened and will know to watch my step in the future. But stranger things happen just opening documents written by different versions of the same word processor. I get some of the strangest formatting in Word attachments much of the time and that is because I simply do not have the correct version of that program to fit the stuff folks send.

## On with the Linux fun

There are a lot of hams enthusiastic about writing ham software for Linux, but it appears to be a complex undertaking. The reason I say this is the documentation that accompanies so much of this software becomes confusing to us "normal" folk who are used to installing Windows software, which usually starts with a double-click followed by a number of Enter keystrokes.

It is truly different from that with the Linux software. And the problem seems to be that there are so many variations of the operating system. I am sure the programmer successfully builds a program and it works just fine on his machine. The tough part is telling us how to get it to work on our Linux machines.

As I progress, I find more ham software available for Linux. Since I started this article, I came across a contest log that looks very good. I went to the Web site and found what appears to be very thorough documentation with all the necessary extracurricular files and instructions for installation. I may be able to get this one going and let you know soon what we have here.

## Some hams are still waiting to take the plunge

Recently, I was asked if I had any interesting info I could pass along to a ham who writes a newsletter that goes out to RVers. That sounds pretty simple. I have a whole bunch of past articles that seem interesting to you and me.

There is a difference when you change audience. I thought about this for a bit and recalled that a lot of these RV folks use WinLink2000. This means they are hams and there is more. They have to have a working mobile HF rig and a computer they are carrying about with them.

This means most of them are just a few shakes away from getting into some real fun with digital ham modes. So I wrote a piece on that subject and emphasized how they should be able to take the equipment they already have and, with an expense estimated between 15 and 60 dollars, they could get into more fun than they could shake a stick at.

And that is what we do here as most of you know. (My claim to fame is for being the cheerleader on the sidelines.) My first lash-up for PSK31 cost less than $15. It was simply two audio cables to and from the rig and the computer. I manually toggled the rig between transmit and receive and had so much fun it was about three weeks before I even stopped long enough to build a PTT circuit.

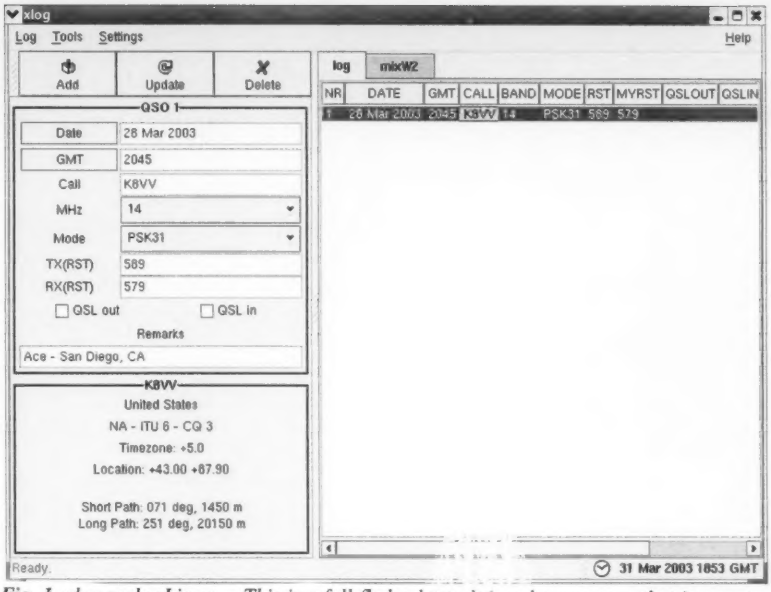


*Fig. 1. xlog under Linux — This is a full-fledged standalone log program that is easy to install (see text) and saves the entries in ADIF format. I only made one contact while getting this in place. It is recorded and in the edit or update mode so you can see some of the features. The notes are hidden in the log display on the right, but you can scroll to read them. There is a place to enter your location info, which then makes it possible to determine beam heading. Of course the station I worked was not really in the "8" call district, so the info was incorrect, but you can get the picture. A good piece of software and there is at least one other module that will work with it to read the info from your rig. I did not get into that as I was just after the good looking log.*

And you know what? Those same two audio cables are still in there working to this day. I have never succumbed to the purchase of a commercial interface. This is not to say those commercial offerings are not good or that there is anything wrong with them. To tell the truth, none of them were on the market when I got started. The only interface I recall from that early era was a project published in *QST*. I have talked to hams who are using that one and they are happy as clams.

The story is simply this: Any way and time you can get a good clean signal on the air and you are satisfied with the operating environs, you've got a system that works. If that is your goal, you have arrived in digital ham heaven.

## So ... for the ham on the sidelines: How to start digital ...

Probably the most important essential to getting started on your digital ham adventure is what you already possess. By the sheer nature of being a ham, you are hyped about all the ways we can communicate via the airwaves. I know I have never gotten over the thrill of picking this invisible signal out of the air on a piece of wire and decoding with the rig to find a signal that none of my neighbors has the faintest clue is there. It doesn't have to be from the other side of the world to give me that euphoric fix. It just needs to exist from somewhere, and when I answer him he hears me and we can "talk."

I recall my first CW contact that was over a span of about 30 miles. It was truly a thrill. Then there was voice which was another thrill, but not as great as that which required the mastery of the Morse code.

The latest and greatest thrill? A few years ago, when the first PSK31 software for Windows by G3PLX became available, I rigged two audio cables between the Icom accessory port and the SB16 soundcard and tweaked knobs and audio driver sliders until I made a contact. Wow! I was in hog heaven and I had spent less money than my first one-tube CW transmitter had cost to build.

That was a great day. I have never looked back. The microphone gathers cobwebs and the CW paddles are usually dusty. I am using the same two cables to this day with some refinements, but those cables, in the

*Continued on page 44*



THE PAPER AND INK USED IN THE ORIGINAL PUBLICATION MAY AFFECT THE QUALITY OF THE MICROFORM EDITION.

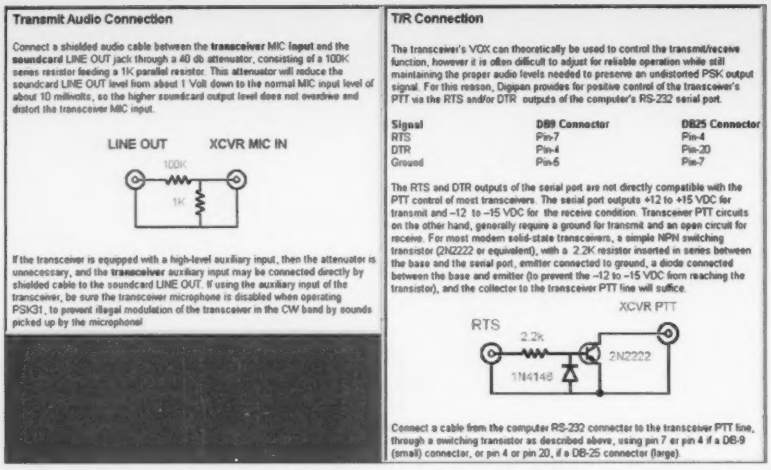
Transmit Audio Connection
Connect a shielded audio cable between the transceiver MIC input and the soundcard LINE OUT jack through a 40 db attenuator, consisting of a 100K series resistor feeding a 1K parallel resistor. This attenuator will reduce the soundcard LINE OUT level from about 1 Volt down to the normal MIC input level of about 10 millivolts, so the higher soundcard output level does not overdrive and distort the transceiver MIC input.
LINE OUT
XCVR MIC IN
100K
1K
If the transceiver is equipped with a high-level auxiliary input, then the attenuator is unnecessary, and the transceiver auxiliary input may be connected directly by shielded cable to the soundcard LINE OUT. If using the auxiliary input of the transceiver, be sure the transceiver microphone is disabled when operating PSK31, to prevent illegal modulation of the transceiver in the CW band by sounds picked up by the microphone!
T/R Connection
The transceiver's VOX can theoretically be used to control the transmit/receive function, however it is often difficult to adjust for reliable operation while still maintaining the proper audio levels needed to preserve an undistorted PSK output signal. For this reason, Digipan provides for positive control of the transceiver's PTT via the RTS and/or DTR outputs of the computer's RS-232 serial port.
Signal
DB9 Connector
DB25 Connector
RTS
Pin-7
Pin-4
DTR
Pin-4
Pin-20
Ground
Pin-5
Pin-7
The RTS and DTR outputs of the serial port are not directly compatible with the PTT control of most transceivers. The serial port outputs +12 to +15 VDC for transmit and –12 to –15 VDC for the receive condition. Transceiver PTT circuits on the other hand, generally require a ground for transmit and an open circuit for receive. For most modern solid-state transceivers, a simple NPN switching transistor (2N2222 or equivalent), with a 2.2K resistor inserted in series between the base and the serial port, emitter connected to ground, a diode connected between the base and emitter (to prevent the –12 to –15 VDC from reaching the transistor), and the collector to the transceiver PTT line will suffice.
XCVR PTT
RTS
2.2k
2N2222
1N4148
Connect a cable from the computer RS-232 connector to the transceiver PTT line, through a switching transistor as described above, using pin 7 or pin 4 if a DB-9 (small) connector, or pin 4 or pin 20, if a DB-25 connector (large).

*Fig 2. Two excerpts from the DigiPan Help file — You can find just about every bit of necessary info in the DigiPan Help file to get your rig connected to your computer. Plus, of course, the file includes instructions to use the software. I talk to a lot of hams who start with this program and are so satisfied they just keep right on using it. "Why change? It ain't broke." See the text for instructions to find this software and also info to find at least one of the popular commercial interfaces. You really don't have to touch a soldering iron to get started in digital ham fun unless you want to.*

## THE DIGITAL PORT

*continued from page 43*

beginning, constituted all the hardware expense it took to get started.

### You too can do this

And it is much easier today. The software has improved and there is an abundance of very good freeware available. I always suggest starting with DigiPan, for several reasons. Not just because it is good as well as free, but it is easy to install, set up, and use. And there is one more really big plus — The Help file is particularly helpful in that it shows exactly how to connect those cables as well as how to build a PTT circuit.

One more thing to give you a little boost: It is not mandatory to have a PTT circuit. What that does is toggle the transmit/receive functions automatically from the software through keyboard or macro commands. You can do as I did in the beginning and simply do that operation manually with the transmit button on the front of your rig. I did that for about three weeks. I was having so much fun, I just did not want to take the time to build the simple little circuit. Other hams I know have done the same thing.

This is my recommendation. Go to The Chart on my Web site and scroll down to Line 17 and go to the DigiPan Web site. Download the free program and install it. This is a very simple, straightforward install. Run the program and click on Help. It will tell you all there is you need to know to get the software up and running.

Plus — The really big plus is in the instructions to connect the soundcard to your rig. Take a look at the screenshot from the Help file and you will see just how simple things can get.

Then, if you do not feel you want to invest time in rolling your own, go back to The Chart and click the link on Line 10. This will take you to one of the popular reasonably priced commercial interface sites where you can get going either with a kit or a fully assembled interface with a cable to plug into your rig. It just can't get simpler than that.

So, if you are wanting to get started yourself or if you have a ham friend who needs a little shove, this is all the information you need. Get to it and I will see you on the air. One of the really nice things that happen in my life is to talk directly over the air to someone who got started in digital because they read about it here. It does happen every once in a while. Logistics and propagation should be the only barrier. Ease of getting started is covered.

### One of those software hassles

From time to time I have to busy myself with Web site stuff. For my own, what I refer to as a utility Web page, I am not too fussy. I have nothing posted for sale. The site is simply there to provide info for the ham community.

But every now and then, someone asks for an attractive Web site for a specific purpose and I find myself at a loss to deviate from my normal black words on white background layout. I have found a very nice piece of freeware that is very powerful called 1st Page 2000 (perhaps a takeoff on the Frontpage name?) that I have been using. It does everything except manufacture cute little patterns similar to what we might call watermarks for the background.

I was searching for something to do that and came across an old "trial" package of Microsoft's Frontpage that came equipped with a big thick book of ideas and how-to stuff. It seemed a bargain. I took it home and installed it, and when I opened it, I was very surprised to see a program nearly identical to what I had been using for the past year, except that it had an option called themes. Some of that looked like what I was seeing here and there on the Web.

Well, to keep this from getting to be a lengthy dissertation on an off-topic, some parts of this theme plan did not work, but the background I was after was intact, so I started working with it and found that, as with a lot of these editors there was a limit to the flexibility. So I found that the theme, once embedded, would transfer to the old editor, and the flexibility was back.

This was all very nice, but trying to follow the rules, I checked with Microsoft and discovered the version of Frontpage I had the trial copy for was so antiquated (close to 3 years!) that there was no support nor update available. Such is the way with proprietary software. I didn't really expect to be shut out so quickly, but it was a learning experience I thought worth passing along.

It certainly looks as though I can continue to use the 1st Page software, and perhaps snag a few of these themes for future reference and have a more powerful HTML editor than I anticipated. What I am saying is simply that if you want a good, powerful HTML editor to fit your budget (free is

*Continued on page 61*

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# A New HF Mobile Installation

*A few months ago, the XYL got a new car, so I, of course got the "hand-me-down." The price of being cheap, I guess. Naturally, I got the 2-meter/440 MHz rig in right away, but it has taken a bit longer to figure out what I wanted to do as far as an HF rig goes.*

There are many steps to having a good HF system to operate mobile. In today's cars you need to figure out what will fit and where before you even begin thinking about the specific characteristics of the radio. Unless, of course, you do not have the need to carry passengers, children's car seats, groceries, etc.

In the past I have used a Ten-Tec 580 Delta, a Kenwood TS-120S, and most recently a Kenwood TS-130S. All of these rigs are fairly standard-sized, but when mounted on a "hump mount" they were reasonably workable. Not perfect — but reasonable. I liked the performance, but I wanted to have a more secure mount this time around and a mounting position that made it easier to see and reach the controls on the front panel.

As any good ham would, I checked out the available options and agonized over exactly which rig would best meet my needs, especially since I have a tendency to keep a rig for an extended period of time. These days there are a number of good choices for mobile installations. After an appropriate amount of Internet surfing and comparing notes with other hams, I decided that the Alinco DX-70T would have all the capabilities and features I desired. It is all-band, covering all amateur frequencies from 160 meters to 6 meters. (I have to admit that up till now my rigs had a top end of ten meters, so I had never operated on six meters. The chance to try something new added some appeal to the decision.) On high power it puts out 100 watts, but when set to low power the ten-watt output can extend battery life significantly.

I figured that in an emergency I could remove the rig from the car and operate it off a deep cycle battery with a solar charger almost indefinitely. The rig can be mounted as one contiguous unit, or the control panel can be installed almost anywhere, with the main body of the radio mounted in a location such as under the seat. The controls are neither complicated nor difficult to see — a major advantage both for mobile operations as well as for those of us who wear bifocals.

I checked various sources and compared prices. The latest version of this radio is the "TH", but the only real difference is that it has higher power on 6 meters. The nearly identical DX-70T is often available used and at a very attractive price. Several times I thought I had successfully landed a rig through one of the on-line auctions, only to be beat out at the last second by a dollar or two. If you've ever had this happen to you, you know how frustrating that can be.

Eventually there was one listed with a "Buy It Now" price that was competitive with the prices I had seen other rigs sell for, so I entered my bid and was informed that I was indeed the winner. About a week later I had the rig in hand, and spent some time perusing the manual before I charged ahead with the installation.

My son Paul (N8YDQ) happened to be visiting from Florida, and together we tackled the installation. Hopefully that won't dissuade him from visiting again in the future. The first task was to run power from the battery to the planned location of the rig. I examined the firewall for any point that would provide a place to pass the power cables. None were to be found. Eventually

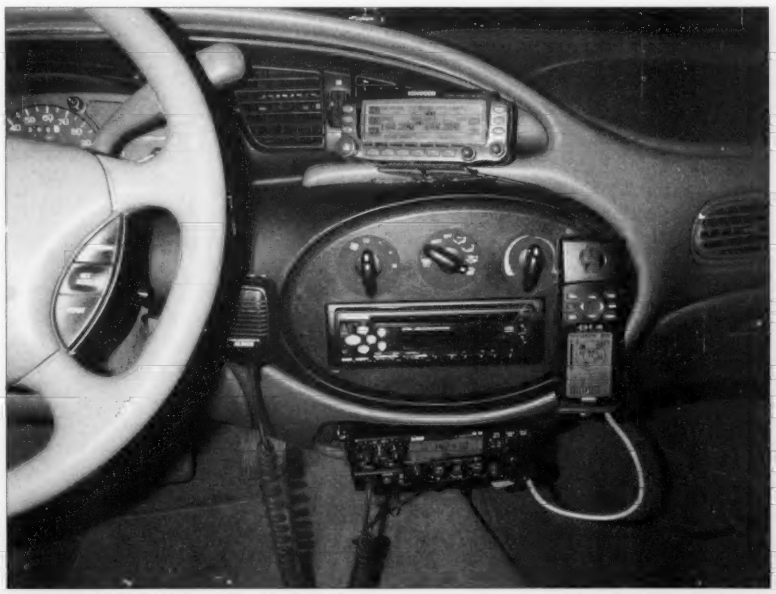

***Photo A.** With the new HF rig installed, I have access to the "low bands" for DX as well as 6 meters, just for fun. The ashtray mount was almost a perfect fit for the Alinco DX-70T.*

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I found a removable rubber plug in the floor. I routed the cables from inside the car through a slit in the rubber plug so that it acted as a grommet and will help prevent any cutting through the insulation.

About 12 inches of the cable runs under the car, and I used cable ties to securely position it away from exhaust pipes, gas lines, etc. I then routed the power cable through the engine compartment and connected it directly to the battery. I found heavy-duty copper lugs that could be connected to the bolts on the battery cables. Make sure you use heavy-gauge cable if the supplied cables are not long enough. The local home improvement chain store fixed me up with stranded cable with red and black insulation. I believe it was 8 gauge — about 1/4" in diameter.

Next came the question as to where to locate the rig itself. My car is a 1996 Ford Taurus, and there isn't a lot of spare space available. One disadvantage the car suffers from is that the center console swings forward if you plan on using the cup holders. I had hoped to mount the rig in such a manner that I could keep the cup holders, since a little coffee is welcome on long drives. I had planned on using the remote control panel feature since it has worked so well for my Kenwood TMD-700A. However, there isn't much room available that would seem to work.

It is important to locate any installation out of the way of the air bags so that nothing gets launched in the event of an accident. Between that and the layout of the controls for the car, options were limited. I looked at floor-mounting the rig, but felt that this was impractical because it would make the controls too difficult to reach. Paul came up with the idea of removing the ashtray. Initially we thought we could mount just the control head in that space and floor mount the main portion of the radio. The reason we decided against that was that the control panel extended just as far when mounted alone as it would if the entire rig were installed as a single unit. In either case, the flip out cup holder would hit the radio. Ah — the price we pay for our hobbies! The cup holder will now remain in its stowed position.

The fit for the radio was tight, but that has certain advantages such as a more "finished" appearance. The standard bracket would not fit, so some generic mounting brackets were used. There are lockable mounting brackets available for floor mount or under-dash installations. If you are thinking of using that kind of mount, check out Bill Roth's home page — [http://home.att.net/~wroth/wsb/html/view.cgi-home.html-.html] — where he has mounts available for the DX-70.

While I was crawling under the dashboard doing the installation, I decided that a few other small things could be done. I finally made a cable for my GPS so that it not only could communicate with my APRS but also would be powered by the car's electrical system. To help prevent a battery problem, I installed a switch under the dash so I can shut off all the auxiliary items when I park the car. I also looked at various options for dash-mounting the GPS unit. After looking at cellular telephone mounts, radar detector mounts, etc., I decided that good old Velcro® was the most practical method.

I'll be writing about antennas in more detail in the near future, but for now I will tell you that I used an MFJ trunk lip mount that accepts PL-259 base antennas. In my collection I have a number of antennas with that mount, so I grabbed a 20-meter resonator and attached it to the mount. Twenty meters is sometimes a good mobile band. The antenna covers a fair segment of the band without being overly large, although you do have to compete with the "big guns" out there. Naturally a mobile installation is never going to compete with full legal power and stacked monobanders on the top of a tower, but it can be a lot of fun.

If you want to get a good idea as to how well your installation is working, watch for a good contest. Shortly after my installation was complete, the *CQ* Worldwide WPX contest was scheduled. In this contest operators are working as many stations as possible and mobile stations are a multiplier — they count for more points. As such, working a mobile station is highly desirable. If you want to see how well your rig works, try running mobile during such a contest. I quickly made a number of contacts from American and Canadian stations, so I knew the rig was working properly.

I did make the modifications so that the DX-70T can operate on the MARS frequencies. Now I can operate mobile for both fun and for emergency operations in support of ARES or RACES as well as MARS. More importantly, I can pass the time when I have an extended drive working a little DX.

So what are the secrets of a good mobile HF installation? First, a rig that has a good "fit" with your operating requirements. Second, a safe and solid rig location that is easy to see and easy to reach. Third, a heavy-gauge connection directly to the battery. And finally, a reasonable antenna. As I mentioned earlier, I'll be writing about mobile antenna choices in the near future. 73

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# Awards and Field Day

*Last month, we surveyed books and other publications about amateur satellite operation. Armed with these resources, the hamsat enthusiast can do a little research to provide new opportunities and challenges. How about awards and contests? They're not just for HF activity. Here are a few to get you started.*

The Radio Amateur Satellite Corporation, AMSAT, has a number of operating awards available for their members and others who chase the hamsats. Difficulty ranges from extremely easy for the Satellite Communicators' Club, to the challenging W4AMI Satellite Operator Achievement Award. We'll focus on the introductory programs.

### Satellite Communicators' Club

If you are already active on the satellites, this is an easy one. The award is available to any operator that has made one hamsat contact. For newcomers, it can be quite an adventure just to make a satellite contact, similar to that first-ever ham-radio QSO. To apply for the certificate, you need only send $1 if a member or $2 if a non-member, along with contact data and two units of postage to AMSAT Awards Manager Bruce Paige KK5DO, P. O. Box 310, Alief TX 77411.

### OSCAR Satellite Communications Achievement Award

This one takes a little more work. You must make 20 "contacts" using any satellite. A contact is defined as a QSO with a station in a different state, DXCC country, or Canadian call area. If you have five QSOs with stations in Manitoba (VE4), only one counts toward the award. The fee is $3.50 for AMSAT members and $5.00 for non-members. Photocopies of both sides of the QSL cards should be sent, along with two units of postage, to Bruce's address above.

### South Africa AMSAT Satellite Communication Achievement Award

The requirements for this award are similar to those of the OSCAR Satellite Communications Achievement Award, with some subtle differences. The award is for 25 QSOs with different stations via low-orbit satellites. All of the contacts could be made with stations in Texas, but they must not be with the same station. Contacts via high-orbit hamsats like AMSAT-OSCAR-40 (AO-40) do not count. Bruce handles submissions for this award for those in North America. Fee, submission info, and return postage requirements are the same as those for the OSCAR Satellite Communications Achievement Award.

### What's next?

AMSAT has other awards with more difficult requirements. You can find out more on the Internet at [http://www.amsatnet.com]. In addition to extensions of the awards noted above, they even have one for 1,000 contacts via satellite, the Robert W. Barbee, Jr., W4AMI Satellite Operator Achievement Award. Other organizations like the American Radio Relay League (ARRL) also have satellite-specific award programs. They include hamsat versions of their popular Worked All States, Worked All Continents, VUCC, and DX Century Club.

### Field Day 2003

It's that time of year again; Summer and Field Day! Each year, the American Radio Relay League (ARRL) sponsors an emergency preparedness exercise called Field Day. The event takes place during the fourth weekend of June. Individual hams and ham clubs compete to make as many contacts as they can from remote locations using emergency power and portable stations. For 2003, Field Day starts at 1800 UTC on June 28th and continues till 1800 UTC on the 29th (2100 UTC for those who begin setup no earlier than the beginning of the event). The Radio Amateur Satellite Corporation (AMSAT) promotes its own version of Field Day for operation via the hamsats, held concurrently with the ARRL event.

While the ARRL [http://www.arrl.org] rules provide a 100-point bonus for the successful completion of a single amateur-radio satellite contact, the AMSAT rules promote activity on all of the current operational satellites. The AMSAT [http://www.amsat.org] rules worked well last year. A key point to remember is that only one contact per each FM, single-channel satellite is allowed. Even with this rule, those stations with dual-band HTs using simple whip antennas won't have much success. It's just too congested. Stations that have completed their single contact via a particular FM satellite are encouraged not to make any further contacts via that satellite during the Field Day period. If one of the astronauts is active on the International Space Station for Field Day, only one contact is allowed per station for the duration of the event. One digital contact via the ISS packet digipeater or PCSat (Nav-OSCAR-44) is also allowed. PCSat has serious power problems and will only be available if control stations feel that the satellite's battery situation can survive the event.

The first-place emergency-power/portable station will receive a plaque at the AMSAT General Meeting and Space Symposium in Toronto, Canada, October 17–19, 2003. Certificates will be awarded for second and third place, emergency-power/portable operation, in addition to a certificate for the first-place home station running on emergency power. Stations submitting high

award-winning scores will be requested to send in dupe sheets for analog contacts and message listings for digital downloads. Check the AMSAT Web page for details and a sample entry form.

There are some good reasons to consider participating in the AMSAT event if you are serious about chasing satellites on Field Day. The AMSAT rules recognize the individual hamsats as separate bands, thus promoting the pursuit of all of the "birds" for the duration of the event. AMSAT also encourages digital satellite activity. Special Field Day messages are sent to the "digisats" for download points by anyone who can receive them. It's even possible to participate in the AMSAT event and get points without a license. While monitoring the downlink from the digisats, complete short Field Day greeting messages can be received without ever transmitting. Each Field Day message download is worth three points.

### Making choices

It would be nice to try to work every active hamsat in the sky on Field Day, but it's just not possible without a lot of gear and a lot of club members or active participants in the satellite chase. The best thing to do is to pick satellites that have transponders, either analog (voice and CW) or digital (1200 or 9600 baud), for which you have equipment.

If you are considering ONLY the FM voice satellites like UoSat-OSCAR-14, AMRAD-OSCAR-27, or the SaudiSats (SO-42 and SO- 50), don't — unless you are simply hoping to make one contact for the ARRL rules bonus points. The FM voice satellites turn into a solid FM-repeater pileup during Field Day. It's fun listening, but that's not what Field Day is all about. Diversify. Gear up for other voice/CW hamsats.

If you have worked the satellites on Field Day in recent years, you may have noticed that a lot of good contacts can be made on some of the less-populated low-earth-orbit satellites like Fuji-OSCAR-20, Fuji-OSCAR-29, and AMSAT-OSCAR-7. During a typical workweek, contacts are few and far between, but during Field Day the transponders come alive like 20 meters on a weekend. The good news is that the transponders on these satellites will support multiple simultaneous contacts. The bad news is that you can't use FM, just low duty-cycle modes like SSB and CW.

This will be the second year for AMSAT-OSCAR-40 on Field Day. Predictions show good opportunities (depending on your location) at the beginning of the event and during early Sunday-morning hours. It should be a very good year for AO-40.

### Equipment

The best radios for Field Day are the ones you use at home, unless — of course — they are heavy antiques. If you have one of the newer, all-mode HF/VHF/UHF transceivers, take it with you. If you don't have one, find someone who does, and borrow it. Be sure that it can transmit on the satellite uplink band while simultaneously receiving the downlink band. Practice prior to the event. There's nothing worse than trying to figure out a strange radio while you are hunting for a satellite, keeping tabs on uplink and downlink frequencies, and adjusting for Doppler — all at the same time. Don't forget to take a backup station.

Be prepared to at least work SSB and CW on Mode J (two meters up and 70 cm down) via the Fujis. With a nice set of two-meter and 70-cm directional antennas, AO-7 Mode B (70 cm up and two meters down) can be a lot of fun. A station that is ready for AO-7

*Continued on page 50*

AMSAT™
The Radio Amateur Satellite Corporation
THIS IS TO CERTIFY THAT
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IS A MEMBER-STATION OF THE
SATELLITE COMMUNICATORS' CLUB
AND IS ENTITLED TO ALL THE PRIVILEGES, PREROGATIVES, RIGHTS, FAVORS, GLORY, RANK, FAME, NOTORIETY, POPULARITY, AND HONOR OF MEMBERSHIP IN THAT WORTHY ORGANIZATION.
In accepting this certificate, the member-station certifies proficiency in satellite communication by having made a successful contact via a radio amateur satellite
Q. MacAllister WA5ZIB
AWARD MANAGER

*Fig. 1. The Satellite Communicators' Club certificate.*

OSCAR SATELLITE COMMUNICATIONS ACHIEVEMENT AWARD
AWARDED TO: Andy MacAllister WA5ZIB
The Radio Amateur Satellite Corporation
12AUG92 — DATE
241 — NUMBER
Q. MacAllister WA5ZIB — AWARD MANAGER
Bill Tynan W3XO — PRESIDENT

*Fig. 2. The OSCAR Satellite Communications Achievement Award certificate.*

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## HAMSATS

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is just a small step away from Mode U/S via AO-40. The 70-cm uplink for AO-7 will do fine for AO-40, and the two-meter receiver can be used as the "IF" or intermediate frequency for an AO-40 S-band (13 cm) downconverter. There are now many easily converted and cheap downconverters available. Check out [http://members.aol.com/k5oe/] for some ideas.

Unless you have experience with low-power satellite work, don't try satellite "QRP" on Field Day. It's really hard even for the best satellite operators, and can be quite difficult and disappointing to demonstrate to potential newcomers. There are too many inexperienced satellite operators on the air during Field Day and many are trying to deal with noisy generators, bugs, and unfamiliar radios. Listening for weak stations is too much to ask.

### Antennas

A simple system for AO-7 Mode A (two meters up and 10 meters down) can get by with a dipole in the trees for 10-meter reception and a ground plane in the clear on the two-meter uplink. For the other satellites and modes, most serious satellite operators will have a VHF/UHF antenna system that will rival many home stations with large, circularly polarized yagis positioned by azimuth and elevation rotors. Something in between these extremes should suffice. A small dish with an S-band downconverter can easily be included in any medium- to large-size satellite array designed for two meters and 70 cm.

### Predictions

Don't assume that you can take a laptop computer to Field Day and do your predictions after you get there. Plot all of your potential satellite passes in advance for every satellite you intend to pursue. Check the results. Look for timing conflicts. Instant Track 1.50 from AMSAT provides some scheduling functions that will help, and it runs on almost any PC. Make sure that the coordinates of the Field Day site and recent satellite element sets have been entered into the software. Don't forget to take along some satellite frequency guides (unless you are one of the few that has memorized all the uplink and downlink bands for all of the operational hamsats in orbit).

Also, check the operating status of your target satellites prior to Field Day. For example, AO-7 is usually in Mode B, but can come up in Mode A when you least expect it. Be ready for surprises.

SA AMSAT
SATELLITE COMMUNICATION
ACHIEVEMENT AWARD
Andy Mac Allister WA5ZIB
This award is made in recognition of having made twenty-five two-way contacts through Phase II Satellites.
AWARDS MANAGER
AWARD NUMBER S.A.1

*Fig. 3. The South Africa AMSAT Satellite Communication Achievement Award certificate is available from AMSAT-NA.*

### Power and interference

There is nothing worse than having all the gear, antennas, predictions and accessories ready to go, and then discovering that you can't hear anything but noise on the downlink frequencies. It happens a lot. Noisy power sources are the number-one culprit. If you can operate with batteries, do it. Satellite chasing is considered weak-signal work. Most of our hamsats only have a few watts output to simple antennas. They can be hard to hear. A typical consumer-grade gasoline generator can produce a lot of noise in the RF spectrum. Be sure to test your generator prior to Field Day. Check it with your satellite rig for a few passes. If it is noisy, either cure the problem or get another power source.

Don't forget about "the other guy." Most Field Day operations include multiple stations for HF, VHF, and satellite work. The folks in the tent next door on 70 cm can ruin your best attempts to make Mode-J contacts. Coordinate with them so that they can go to another band or take a break during those short intervals when the Fujis or FM hamsats come by.

If your group operation has any terrestrial VHF stations or two-meter packet systems, they can destroy any chances you might have had hearing AO-7 on Mode B with its two-meter downlink. As with the UHF folks, make your intentions known and arrange for an operating schedule, in advance. Even with all these precautions, it is always a good idea to isolate the satellite station from the others.

There are even a few potential interference problems associated with S-band reception of AO-40. Microwave ovens and wireless 2.4 GHz devices like wireless LAN cards and portable phones are at the top of the list. It is doubtful that there will be a problem, but check first! A lot of mobile homes have microwave ovens, and hams tend to be techno-geeks who collect new RF toys just to see what they will do.

### Have fun!

You may have multiple rig difficulties, antenna failures, computer glitches, generator disasters, tropical storms, and even satellite problems, but the goal is to test your ability to operate in an emergency situation. Try different gear. Demonstrate satellite operations to hams who don't even know that the hamsats exist. Test your equipment. And finally, have fun doing it! 73

# QRP

*Low Power Operation*

Mike Bryce WB8VGE
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# The Argonaut V

*The new Ten-Tec Argonaut V QRP transceivers are now shipping. After a few false starts, the units began to arrive late October of 2002. I've talked about the new rig several months ago, so I won't go into great detail again. However, a quick overview should be in order.*

The Ten-Tec Argonaut V is a DSP-based HF transceiver covering all HF ham bands in all modes. It is also known as the Model 516. It will operate in AM, FM, SSB, and CW modes. Of course, you get the famous Ten-Tec QSK CW break-in keying with the Argonaut V. There's an internal CW keyer built into the Argonaut V.

There are two VFOs and 100 internal memories. You can have an almost unlimited amount of memories using an external computer controlling the Argonaut V. To know where you're at, the Argonaut V uses seven-segment LEDs for the main and secondary displays. There are several green backlight enunciators as well.

The Argonaut V transceiver will also provide general coverage receive from 500 kHz to 30 MHz. The receiver boost is 0.2 µV typical for 10 dB S+N/N @ 2.4 kHz bandwidth sensitivity. You have at your fingertips your choice of up to 34 DSP-generated filters built into the Argonaut V. These range from a rather narrow 300 Hz to a 6-kHz-wide filter for shortwave AM broadcast listening. The FM mode bandwidth is set at 15 kHz.

The Argonaut V's transmitter puts it into a class other than pure QRP; the output can be adjustable from 1 to 20 watts via a front panel control. The RF output is ALC-stabilized.

You can order the optional TXCO and get frequency stability of +/- 3 ppm or +/- 20 ppm without the TXCO. Either with or without the TXCO, the Argonaut V is PSK31-ready out of the box, but take it from me and order the optional cable set from Ten-Tec. It will make your life easier!

And like all the current Ten-Tec rigs, the Argonaut V is equipped with Flash-ROM to enable instant upgrading via the Internet.

The Argonaut V requires 12 to 14 volts at 500 mA on receive and up to 6 amps on transmit at 20 watts. The Argonaut V tips the scales at five pounds.

## First impressions

Let's face it: First impressions are lasting ones. And, out-of-the-box, the Argonaut V surprised me. Ten-Tec, while making great strides in quality in the last several years, always seemed to be a step or two behind the other guys when it came to fit and finish. With the Argonaut V, that problem is now over. The fit and finish of the rig is outstanding. Everything fits like it should. The legends are clear and crisp. The main tuning knob is a heavy zinc affair with lots of mass. In fact, I would bet the first thing most people will say when they open the box up is, "I am impressed."

## Digging deeper, and pushing some buttons on the way

The Argonaut V comes with a power cord, mode 701 hand microphone, instructions, and miscellaneous connectors. Hookup is simple and to the point. Apply +13.8 volts to the radio and turn it on.

The Argonaut V operates very much like its older brother, the Ten-Tec Jupiter. The "Func" control on the Argonaut V is the same as the "multi" on the Jupiter. These controls, along with the band and VFO controls, are very much alike. Within a few minutes after powering up the rig, I was making contacts. It really is that easy to operate.

## More buttons to push

Changing bands is a simple process of pushing the band button. You cycle through the bands. You can't go backwards. You can press the FUNC key and BAND key to store your current frequency in the stack register. There's one stack register for each band! This makes hopping around a bit quicker. Or you can use the memories. More on that later.

Some buttons provide more than one function. For example, pressing the FUNC button and then the A/B button turns on the 20-dB RF attenuator. Some buttons are mode-dependent. The keyer button will only work in CW mode. Speaking of keyers, the internal keyer works just great. You set the speed by the multi knob. You also have control over the weight of the CW shaping and sidetone frequency, CW offset, and sidetone volume.

Nearly all the functions of the Argonaut V are controlled this way. The VOX works the same way as the keyer; you control the different VOX functions using the multi control. The VOX controls the QSK feature of the rig in CW mode.

When in these "subset" modes, the secondary display is used to let the operator know what is going on. The values may show the bandwidth or the amount of RIT being used. The display is somewhat encrypted, and it takes a bit of practice to read some of the results. For example, when in the VOX mode, the display will show "Gn", which means VOX GaiN.

## Memories

The Argonaut V has 100 internal memories. These hold the band, along with mode and other information for that specific memory location. The memory operation in the Argonaut V is a bit odd. It's not hard to do, but somewhat different from what I've seen in other gear.

The radio can be in either VFO mode or

*Continued on page 52*

memory mode. You select either one by alternate presses of the VFO/Memory button. While in memory mode, you can select one of the 100 internal memories via the multi control. Once you have selected the memory location you want to use, you rewrite it back into the VFO. There is no "mem recall" button used in other transceivers. To write a memory location, you dial up the band, frequency, mode, and bandwidth, etc., you like. Then press the function button and write button while in VFO mode. This will cause the display to show the last used memory channel number and its contents. The multi knob allows you to scroll though the memory channels or to move to an empty channel. A second push of the write button actually executes the copy operation.

To access the memories, pressing the V/M button will cause the MEM light on the enunciator row to glow. This lets you know you are in memory mode. Again, the multi knob allows you to scroll through the memory channels. Pressing FUNC and WRITE while in MEM mode WRITES the current memory BACK into the current VFO. It's not as hard as it seems, but it's very easy to get the steps out of sync and you end up rewriting the wrong stuff in the wrong location. It's a matter of practice until you get the sequence down correctly. The Argonaut V sports the usual RIT and XIT. There's also a very usable PBT control. There's a squelch control for the FM mode and for general scanning of the VFO or memories. The squelch is useful on all modes.

You can have the Argonaut V scan for a busy frequency via the VFO or memories. You can program the scan to skip busy frequencies and to scan backwards.

### Multifunction meter

The Argonaut V's S-meter is quite busy. Besides the S-meter function, the meter also provides for setting the output power to five watts, measuring reflected power, measuring SWR, and measuring power amplifier current. To read the various ranges, you place the rig in CW mode and key it with a microphone's PTT. To measure PA current, you key the mic, and push the A/B button. The PA current of between 0 and 7 amps is read on the S-meter scale. To read SWR, again you press the PTT line while in CW mode and then press the SPLIT button. The SWR is read on the 0-25 watt power scale with a 1.0:1 SWR at 10 on the scale. A 2.5 SWR would read 25 on the scale. There's a lot of information to be displayed on the meter and it can become very confusing. Unless you use these functions all the time, keep the manual nearby; you'll need it.

### Operating with the Argonaut V

The Argonaut V operation is pretty much straightforward. Select the band, frequency and mode. The QSK works just great with no pops or clicks. I use the internal keyer and have no problem with it. SSB operation is just as straightforward. Select the proper sideband for the band in use and adjust the mic gain so that the ALC LED just flashes. There's plenty of gain, and it's easy to overdrive the circuit, so make sure you have the gain set correctly.

### Nits to pick

I truly believe there is no such thing as a perfect radio, and of course the Argonaut V is far from perfect. There are some things that I don't care for. Not that they're wrong or bad, it's just not to my liking. I don't like tuna salad, but that does not make it bad for those who do! So, in no particular order, here goes:

1. Band selection is only one direction. You can't back up if you miss the band you wanted. No big deal, but it is a pain in the butt. Perhaps a software upgrade will fix this.

2. You're not given enough information on the status of the radio. For example, you can't tell if you have the attenuator on unless you toggle it off and on while watching the effect on the S-meter. The same goes for the main tuning lock. The only way to know if you have the tuning locked is to try to tune the radio. If it does not tune, then the lock function is on! Now, having said that, I understand why some of the functions don't have a status enunciator: lack of space on the main display. To get everything on there, a costly LCD would have been the only choice. That would have raised the cost of the radio considerably.

3. Whoa! I can't believe there's no automatic notch on a DSP-based radio. Perhaps a software upgrade will address this problem, too.

4. If you buy the optional fans for the PA heatsink, they run all the time.

5. Not a problem for me, but for those that must have one, there is no RF gain control on the Argonaut V.

6. The radio does not work very well at operating voltages under 12.5 volts. At 12 volts, things get a little dicey.

### But ...

All and all, the Ten-Tec Argonaut V is a super radio. I've had mine now for about six months and have just been amazed with its performance. No matter if I've been on SSB on 40 meters or FM on ten meters, the audio is great. The CW QSK is probably the best yet from Ten-Tec.

If you think that QRP just may not be your cup of tea, the 20 watts of RF that the Argonaut V produces will generate a lot of contacts. QRP operators at the five-watt level, too, will be at home with the Argonaut V with just a twist of a knob.

Ten-Tec has produced a great little transceiver. No matter if you like to run five watts or go for the gusto with twenty watts, the Argonaut V will serve you extremely well. 73

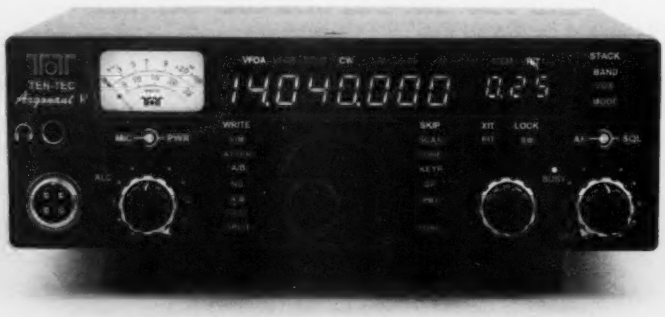


***Photo A.*** *The Argonaut V.*

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# Tracking Opportunities — Owls, Bats, and PLBs

*I have found hundreds of hidden radio transmitters over the years. Each time it has been fun and exciting, but never more so than the first time I tracked down a radio-tagged animal.*

It wasn't too hard, because that tag was on a slow-moving desert tortoise. Nevertheless, that experience made it clear how much can be learned about wildlife this way.

Biologists want to know about the effects of habitat, diet, dispersal, migration, and predation on species of concern. Radio tracking is an important tool for them. However, it's not easy for a few researchers to track critters that move large distances, such as migratory birds. They sometimes use small aircraft for radio tracking, but that's very expensive and requires consistent good weather.

That's where hams come in. We're scattered throughout the country, most of us own equipment to monitor VHF frequencies, and many of us are interested in using our hobby for public service.

## Learning about owls

For five years, ham operators in central and western states have carefully tuned their receivers each fall and spring, listening for weak pulsed signals from radio tags on Western Burrowing Owls (**Photo A**). We've provided volunteer support to researchers in the state of Washington and the provinces of Saskatchewan and Alberta.[1] This ongoing project has helped researchers learn the migratory habits of these threatened birds, which have been shown to travel almost 2,200 miles to their winter homes in Mexico and southern states.

Unlike other Strigiformes, burrowing owls nest underground in holes that have been dug and then abandoned by other animals such as ground squirrels. They require suitable habitat consisting of open fields with adequate food supply for foraging, roosting sites, and low vegetative cover to allow them to keep watch for predators.

As a result of uncounted hours of effort by researchers, park rangers, birding enthusiasts, ham operators, and scanner fans, a great deal has been learned about the Western Burrowing Owl. Much of the news is not good. On 7 April 2003, a coalition of conservation groups, including chapters of the Audubon Society, petitioned the California Fish and Game Commission to list this bird under the California Endangered Species Act.

"California supports the largest remaining breeding and wintering populations of the species," states the news release accompanying the petition. "Many early accounts of the burrowing owl reported that the species was one of the most common birds in California. They historically ranged throughout the Central Valley, in coastal areas from Marin County south to the Mexican border, and in sparsely inhabited desert areas in northeastern and southeastern California.

The release continued, "Surveys conducted throughout most of California during the early 1990s documented a nearly 60 percent loss in the number of breeding owl colonies known from the 1980s, and a decline in overall population numbers by eight percent per year. Breeding owls have recently been completely eliminated from five counties and are nearing so in at least six others.

"Over 71 per cent of California's breeding owls currently live in the margins of agricultural land in the Imperial Valley, an area that accounts for only 2.5 percent of the land area of the state. Over 15 percent of the state's breeding owls reside in the southern Central Valley, an area undergoing explosive human population growth and rapid conversion of agricultural lands to urban development."

## It's Florida's turn

This spring, hams in the Sunshine State and nearby will have a chance to participate in studies of this fascinating bird. Robert Mrykalo, a graduate student in the Environmental Science and Policy Department at the University of South Florida at Tampa, is studying Florida Burrowing Owls. This is a slightly different subspecies, thought to have a range limited to Florida and the Keys. However, there is one 40-year-old report of a sighting in North Carolina. Researchers have banded these birds in the past, but none of the banded owls has been recovered after leaving its breeding home.

"These owls are unique due to the fact that they dig their own burrows," Robert writes. "Florida Burrowing Owls are

***Photo A.*** *Burrowing owls are unusual because they prefer grasslands instead of forests. A new opportunity for hams to help study them is beginning soon. (Photo by Joe Moell KØOV)*

***Photo B.** This Mexican Long-nosed Bat has a face covered with pollen. Biologists want volunteers knowledgeable in RDF techniques to help track these bats in a Texas project this summer. (Photo by Merlin D. Tuttle, copyright Bat Conservation International, used by permission)*

currently listed as a 'Species of Special Concern' due to a reduction in population size because of loss of suitable habitat.

"My goal is to place necklace or tail-mounted transmitters[2] on the owls and attempt to follow them from late spring through summer this year," Robert continues. "There has been past telemetry work conducted on burrowing owls in Cape Coral, Florida, but the owls dispersed past the receiving distance of the telemetry receivers. The researchers were unable to locate the owls using aerial surveys. I found it fascinating that ham and VHF monitors were able to assist in locating transmitter signals! The one concern I have is that the owls on which I have placed transmitters will disperse large distances. I do not think I will have sufficient research funding to conduct aerial surveys."

Robert and his associates will place transmitters on Florida owl hatchlings, beginning in April or early May. They will track them locally as they leave their burrow nests and learn to forage. Between July and September, the young owls will take off for parts unknown. Nobody knows why, since there will still be plenty of rodents, insects, and other food for them.

Nobody knows where they will go, either. Perhaps a *73 Magazine* reader will copy a tag signal and provide a valuable clue. Better yet, maybe a transmitter-hunting ham will track down one of the tagged owls for a positive sighting.

For more information on this project, including the list of all active tag frequencies when available, visit the "Homing In" Web site. You'll also find ideas for suitable receivers and antennas, plus other tips on hearing wildlife tags. If you want to get earliest notification of projects like this, plus an opportunity to exchange correspondence with wildlife researchers and other volunteer monitors, join the Biotrackers E-mail reflector. Subscription information is at the "Homing In" site.

### Bats in the cacti

My Burrowing Owl Project Web page and Biotrackers mailing list have attracted favorable attention throughout the research community, so more biologists are enlisting the help of hams, scanner enthusiasts, and transmitter hunters. One of them is Angela England of Bat Conservation International (BCI) in Austin, Texas.[3]

"Mexican Long-nosed Bats are the nighttime equivalent of hummingbirds," Angela writes. "They feed on the nectar and pollen of giant agaves, also known as 'century plants' or magueys. These endangered bats are highly migratory, capable of flying long distances in a single night, and are thus highly efficient pollinators for these plants (**Photo B**). Yet little is known about how much time they spend each night foraging, how far they go in a single night, or what landscape areas they use.

"This summer we will be radio-tagging 25 of these bats in Big Bend National Park," Angela continues. "Due to the small size of these animals, we can only use the tiniest of transmitters, and the batteries only have a 10- to 14-day life span. We plan to collect as much information as possible during this time frame, and are looking for volunteers to help.

"Between June 23rd and July 11th, the main crew of about 10 people will be hikers, who will carry portable directional antennas and receivers to high areas to record signal direction and strength data minute-by-minute throughout the night. We could also use one or two vehicle-based people to be stationed around the periphery to monitor and potentially chase any tagged bats that leave the park. (Last year one of our tagged bats left the park and was last heard approximately 27 miles away from the roost.) We would prefer to have all volunteers be hiking-capable, so we can interchange harder and easier assignments nightly.

"We are asking for a two- to three-week time commitment from all volunteers, because we need the data to be collected in a consistent manner. We'll be providing all training, food, lodging, and equipment, but if you happen to have your own receivers and antennas, we'd love it if you could bring them! We'll be using the 150, 151, and possibly 149 MHz bands. Even if you can't commit that much time, if you happen to be in west Texas, southern New Mexico, or northern Mexico during that time frame, you would also be welcome to listen for our tagged bats on your own."

What an opportunity for physically fit transmitter hunters! Hiking in Big Bend Park would be a great way to get in shape for the USA ARDF Championships in Cincinnati at the end of July.[4] The "Homing In" Web site will carry the latest details on the status of this project, along with frequencies and contact information for BCI.

### Personal locator beacons legalized in USA

Another way that transmitter hunters serve the public is by becoming volunteers for organizations that track down activations of aircraft Emergency Locator Transmitters (ELTs) and maritime Emergency Position Indicating Radio Beacons (EPIRBs)(**Photo C**). Beginning in July, big changes are coming to the world of emergency beacon tracking, as the FCC permits these beacons to be used by individuals in addition to pilots and boaters.

Aircraft ELTs activate upon severe impact and transmit continuously on 121.5 and 243.0 MHz with a distinctive whoop-whoop tone. Power is only about 100 milliwatts, so ground range is only a few miles at most. However, they can easily be detected by the SARSAT/COSPAS system of satellites.

As I explain in detail in my book,[5] USA's SARSAT and Russia's COSPAS satellites are in low Earth orbit and use the Doppler frequency shift that they observe while passing over the beacon at high speed to determine ground position. Two passes are needed, and data can only be collected when a satellite is above the horizon for both the beacon and a ground station. That means it takes at least two hours for a good fix.

Another problem has been that 121.5/243 MHz ELT transmissions are anonymous. The satellite can't tell whose ELT is squawking, or even be sure that it's an actual ELT. Occasionally an ELT alert turns out to be something else, such as word processing equipment.[6]

In 1988, EPIRBs were authorized to use 406.025 MHz in addition to the other two frequencies. The 406 MHz transmission is a short high-power burst of digital data that

includes a unique identification. Not only did this help solve the anonymity problem, but satellites could store this data when out of range of a base station for later forwarding. That shortened the alert time cycle considerably. The newest EPIRBs now have built-in Global Positioning System (GPS) receivers and can include GPS coordinates in the data stream.

As of last year, there were 82,000 registered ELTs and EPIRBs in use, plus an estimated 500,000 of the older unregistered units. One source claims that they have enabled rescues of 14,700 persons in the last 20 years. With evidence like this, why wasn't this technology made available to hikers and other individuals who might need rescuing, too?

Other countries, including Canada, Australia, and Russia, have set up programs to permit individuals to carry Personal Locator Beacons (PLBs) and activate them manually when they need rescue. PLBs use the same transmitting frequencies and satellite detection system as ELTs and EPIRBs, but they have somewhat less stringent design and feature requirements, making affordable pocket-size units possible. Despite success elsewhere, FCC steadfastly refused to legalize PLBs in the continental USA through the 1990s.

Opponents of PLBs feared that they would become so popular that false alarms and inappropriate activations would clog the system, detracting from its primary maritime and aviation uses. They cited examples from Canada, such as the New York man on a solo two-week canoe trip in the Northwest Territories who missed his connection with the bush plane that was to pick him up. Even though he had plenty of provisions to stay a while longer, he chose to set off his PLB, triggering a rescue with Hercules aircraft and helicopter flights that cost the Royal Canadian Mounted Police about $100,000. In another case, a man and his son on a kayak trip set off their PLB because they were tired and "it was becoming hard to paddle." A Twin Otter came to bail them out and almost crashed trying to make a landing at their campsite.

Arguing that inappropriate use by a few shouldn't be the sole reason to deprive everyone else of a useful rescue tool, proponents kept up the pressure. In 1995, a pilot program began in Alaska to allow PLBs in the wilderness under a cooperative agreement with National Oceanic & Atmospheric Administration (NOAA), U.S. Air Force, Coast Guard, and Alaska State Troopers. In a recent year, there were 54 rescues attributed to these PLBs, many of them snowmobilers stranded in subzero temperatures.

***Photo C.*** *Cathy Livoni KD6CYG enjoys hidden transmitter hunting on the ham bands. She also tracks aircraft ELTs as a volunteer with the Civil Air Patrol. (Photo by Joe Moell KØOV)*

In January 2000, FCC issued a Notice of Proposed Rulemaking on the subject. Of the comments received, less than 22 percent opposed authorization of PLBs in the rest of the USA. A favorable Report and Order was adopted on September 27, 2002. Beginning July 1, 2003, 406 MHz PLBs may be sold and used in the USA. Each must be preprogrammed with a unique identification code. The purchaser must send in the supplied registration card with the ID code and other pertinent information to NOAA immediately.

For PLBs bought by wilderness outfitter businesses to be rented for short periods to hikers, kayakers, and so forth, the new rules require the outfitter to provide a 24-hour contact number to NOAA, for rapid determination of who's sending alarms from rented PLBs.

There are strict technical stands for PLBs, so you can't build your own. In addition to 406 MHz digital burst transmissions, they must also beacon continuously on 121.5 MHz, with a special "P" identifier in Morse code to distinguish them from ELTs and EPIRBs. To make PLBs pocket-sized, the 121.5 MHz transmitter can run as little as 25 milliwatts. The battery must be able to power the PLB for 24 hours after activation, following a shelf life of at least five years.

It's expected that street prices of PLBs

*Continued on page 61*

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# Converting 11 GHz LNB Preamps to 10 GHz

*Since the first article in* 73 Magazine *on converting the beige Channel Master LNB to a 10 GHz preamp, many questions have surfaced. The first and foremost concerns whether LNBs can be used for this same TV satellite service. And the answer is a resounding yes.*

Well, yes with some reservations. Those reservations come in the form and factor of considerations of the LNB you acquire. They're all usable — it's just that some in the conversion are harder than others to adapt to coax output tapoff of the final RF amplifier to SMA transition. That's assuming that the input remains waveguide input.

Other questions suggest conversion to SMA input also, and while that is possible, some noise figure questions remain. Let's deal with the basic conversion applications between models, speak in general as to what needs to be done to convert an LNB, and then let you evaluate what needs to be done mechanically with the unit you pick up.

Regardless who made the converter you have, they are all made to operate in the same frequency range for satellite converters. That is, in the 11.7 to 12.2 GHz region, with circuitry broadbanded enough to allow operation in the 10 GHz band by removing any RF amplifier OUTPUT filter. We are sticking with the single RF amplifier circuits (an LNB with one RF preamp, not one with two RF preamps, and regardless of the number of RF amp stages, usually 2 to 3 for a single RF amp). The dual RF preamps are usually made for both vertical and horizontal orientation switching from the TV converter for orientation desired and will not be covered here. Let's stick with the single RF amplifier LNB conversion. Surpluswise, I feel that these LNB converters are worth about $10 to $15 each, with easy-to-convert units demanding slightly greater dollar value.

Basic operation can be checked, with the source being a simple Gunn oscillator or signal generator set to a frequency in the original passband of the amplifier, 11.5 to 12.7 GHz. Internal to every LNB is a mixer and a local oscillator (usually a DRO, dielectric resonator oscillator). That's a big word for an amplifier that is made to feed back RF coupled through a high-Q dielectric ceramic sort-of-aspirin-pill-looking device turning the amplifier into a feedback-controlled oscillator.

This oscillator (LO) is offset about 1.5 GHz from the operating frequency, producing an IF frequency of 1 to 1.5 GHz. Testing is to power up the LNB with a bias "T". A bias "T" is simple to construct: It's just a small box with a feedthrough capacitor and 2 coax connectors, a mica capacitor and a RF choke. The dipped mica capacitor ties between the input and output connector, its value being something near 10 pF.

On the input side of the bias "T" (LNB side), a small RF choke connects to the feedthrough capacitor to feed +DC for amplifier LNB power. This voltage can be between +12 and +18 volts DC. It is applied in with the IF signal feeding the DC-isolated receiver converter on top of your TV set. (In normal applications, the DC bias is part of the receiver on top of your TV set.) In any case, power and IF signals cohabitate the coax between the LNB and receiver, isolated by the chip capacitor in a bias "T". To test, power the bias "T" with + DC 12 volts. I placed the converter input into my spectrum analyzer set to the IF frequency of 1 to 1.5 GHz.

Any LNB can be tested in this way, copying a weak signal loosely coupled through its waveguide input to the spectrum analyzer or other receiver of choice that can copy these 1 GHz signals. As long as your LNB takes + DC voltage, they all can be measured up between each other by reading the gain on the spectrum analyzer or S-meter on your wide-range monitor receiver. All the converters I have from Channel Master are positive DC power. However, be sure of what you have. There could be some out there that are negative DC. Just check first to be sure what you have. They have been plainly marked as to polarity.

The RF amplifiers that lie within the units can be made to function on 10 GHz with little investment. Most of the units that I have been able to obtain in surplus were of the Channel Master series. The iterations were many, and you could see developmental changes in style and manufacturing techniques differing between models greatly. However, all taken with a grain of salt, the basics are still there. Each unit is powered with a DC source feed up the coax to an "F" connector on the rear of the LNB, feeding anything from +12 to +15 or so volts with

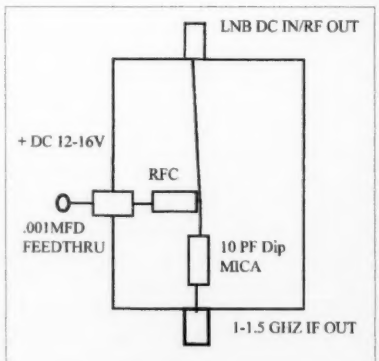


***Fig. 1.*** *Drawing showing construction of bias "T" for use in testing various LNBs. Voltage and polarity of DC voltage depends on LNB model. Most of the Channel Master LNBs that I have seen require anything between +12 to +24 volts DC. I basically keep my voltage in the +14 to +16 volt range for all tests, as there is a +12 or similar voltage regulator internal to all of the LNBs I tested.*

internal regulators taking care of the lower voltage used by the internal circuitry. This internal supply feeds the RF preamp, local oscillator, and IF amplifier. All negative voltage for bias for the FETs in the preamp is also generated by the internal power supply for gate bias. Couple the circuitry of a mixer and internal filter, which is usually connected to the output of the RF preamp and mixer input, and you're ready to sail into the conversion process to 10 GHz. The thought here is that if the LNB basic tests show it to be functional, it can't turn out to bad even if it gets smoked, as the investment is minimal and this is the worst scenario.

Disassemble the case rear nut, push out the case of the LNB, and remove appropriate covers protecting the power supply, IF, mixer, and RF preamp circuitry. What you're trying to ascertain is how to shut down the DC to the LO and cut the circuit board with an X-acto knife on the output of the last stage of the RF preamp/RF filter input to remove the filter from the circuit. You want to leave enough of the filter to serve as a pad to allow insertion of a 1 to 2 pF chip capacitor from the stripline feeding the filter (last-stage RF amp output) to a filter element used for a connection PC board pad. The remaining part of the filter is used to support a small section of 0.085 miniature Teflon hardline coax to couple the RF preamplifier out rather than feed the filter output to mixer input. By removing DC power to the IF amplifier and the LO oscillator, DC current will be slightly reduced and the oscillator being disabled will not interfere with the operation of the RF preamplifier circuitry. That's the easy part, not the clever part that makes the conversion easy or harder. Just leave the components in place and cut DC supply lines with an X-acto knife to remove DC power.

The reassembly of the RF preamplifier requires that the metal shield removed to gain access to the circuitry must now be put back into place. Holes or compartment cuts need to be filed or drilled to accommodate the added chip capacitor depth on the circuit board, and passage for the 0.085 hardline coax to allow the cover plate to be reattached with the extended new RF preamp output. The cover plate is important in that it prevents the circuits from "talking" between each other and isolates them in small, "rat race"–looking compartments to prevent crosstalk and unwanted oscillations between compartments so shielded. What I did on the black LNB was to notch with a file the bottom of the compartment cover to allow the SMA connector and its 0.085 coax to extend out of the rear body of the LNB. Solder the coax shield to the ground external rail on the outside of the body of the LNB PC board. Continue to solder this ground to part of the RF filter (now disabled) for coax strength. This part of the solder to the filter has no electrical properties but does add strength to the miniature coax. Make sure the new coupling capacitor has room in height and does not short out when the cover plate is reattached.

### Conversion of the Channel Master black LNB, part #6246-01

The black LNB is marked 11.7 to 12.2 GHz, 1.3 dB noise figure. My conversion of the black LNB was essentially the same electrically as for the large beige LNB unit. Differences are in the connections for power supply and IF input from the mixer connections between the power supply PC board and RF amplifier board.

To locate these two leads, position the board with the power supply towards you with the waveguide to your left. Locate the red lead on left bottom and unsolder it. At right bottom, the white clear lead is IF out of mixer — unsolder this lead also. That allows you to gently lift the power supply board to a near vertical position. This will allow you to unscrew the cover to the DRO LO assembly and remove it. Take the cover off easily. The board is held down by two leads to the RF board topside, DC power in and RF LO out to mixer. These leads can be observed on the RF preamp board top just left of 12 o'clock positions on the board. The LO output goes to a stripline filter element and the DC power lead comes in from the top left and is terminated just below the LO output lead. Unsolder both these leads on the RF amp board.

Extract the DRO LO unit from the center of the housing. Disable the IF amplifier by removing DC voltage from the devices marked "R37". These are the IF preamp's four stages (I left them alone). Then disable DC voltage to the MMIC amp by removing the MMIC or removing the resistor tied between MMIC output and the "F" connector center connection. I just removed this connection for tests. Supply a new DC power lead to the "F" connector power as DC input +12 volts. Reattach the screws holding down the power supply PC board and voltage regulator.

Conversion to the RF amplifier board is

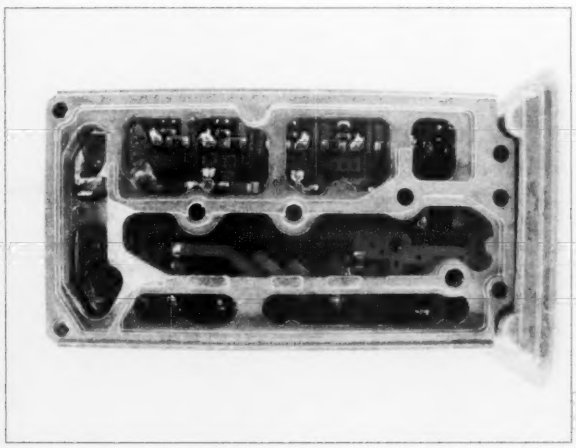

***Photo A.*** *Top view of black LNB with cover plate removed and "rat race" compartment shield in place. RF amplifier stages shown at top of picture. Coax hardline would exit out left center of LNB under shield plate and soldered to PC board ground.*

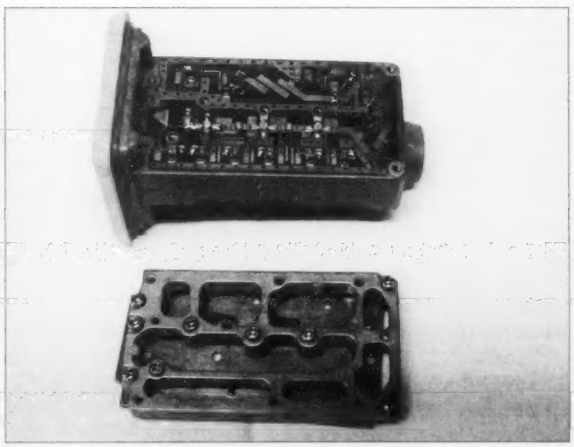

***Photo B.*** *"Rat race" compartment cover removed and RF amplifier 3-stage amp, bottom of PC board. Waveguide input to left and output circuitry for coupling to 0.085 hardline for amp output to right.*

nearly the same as for the large beige unit. Cut on bottom right enough of the filter lines to allow an isolation chip capacitor to be installed on the stage three output to part of the first input line of the bandpass filter. Make sure it will clear the top cover plate used for isolation between stages. This allows a connection point from the capacitor to the 0.085 coax line. The SMA connector on the far end serves for RF out of preamp. Cut/file a hole in the bottom of the RF amplifier isolation plate to allow RF coax to exit housing and provide rigidity. It would be best to use miniature rigid coax like 0.085 hardline. I don't have any quantity to supply, but found a short section of Teflon coax about 2 inches long with an SMA female connector on one end, and prepped the other end for insertion on amp stage 3's output chip cap. Should work. Haven't had time to try it out, but believe should be OK. Test and adjust as necessary.

### Conversion of the Channel Master large beige LNB, part #NJR2115-FH

The noise figure was 1.1 dB on the unit I selected to convert; it varies a few tenths of a dB between units.

Start by pulling the unit apart. Remove rear "F" connector nut and press LNB assembly out of housing. LNB IF amp and LO assembly resides sandwiched between the RF amp PC board and the power supply PC board. To access and remove the LO and IF assembly, remove all screws from the power supply board. Unsolder the three leads just above the 1 watt resistor and varistor. This frees DC power and bias and the +12 volt DC input to power supply board. (Do not unsolder any of the 6 wires in similar black cable.)

Remove all screws holding the RF amplifier PC board shroud and top cover plate, giving access to RF amp board components. Looking at the 6-wire black cable that connects to the power supply board and the waveguide to your left, the three RF amp devices run from (input) bottom left to bottom right (output). Notice that there are 2 wires soldered to the RF amp board, top left side of PC board. One is LO injection to FET mixer, and the other, topmost left, is DC power to the DRO local oscillator. Unsolder both leads from the PC board. This should allow you to gently lift both the power supply and RF amplifier PC boards off the metal housing. Use static prevention measures, as the RF amplifier input gate is now unprotected and with a little static mishandling you could destroy the first RF amp FET. Use a grounded workstation (unetched PC board ground straps and grounded soldering iron station).

With the power supply and RF amplifier board removed, now unscrew the LO board and IF amplifier board from the center of the housing and set aside; it is not required in the conversion. Replace the power supply and RF amp board, and screw down the power supply board first. Position the RF amplifier board and prepare it for stripline modification. As above, with the RF amp positioned so that the black 6-conductor cable is at 6 o'clock, the first-stage waveguide input is to the bottom left. On the bottom right, the output of the stage-three amplifier is a filter presumably set for 11.7 to 12 GHz. Two GHz is not modifiable and needs to be cut off with an X-acto knife. Leave the first element that is capacitively coupled to the stage three output. About 1/8th of an inch from the ground end of this first element, cut a 1/16th-inch open in the path. The ground will have a 0.085 section of hardline coax to ground. The center of the 0.085 coax connects to the open end of the cut, which is the output of stage 3. Leave the capacitive coupling lines for DC isolation.

Exit the 0.085 hardline through the rear of the housing above the "F" connector, and solder the coax to ground. The top cover plate needs to be filed out to accommodate the round coax hardline; I suggest firmly improving rigidity, as the ground surface on the PC board is quite narrow but a good ground. Improves rigidity. When that is done, screw the top housing in place and the top cover plate. Attach to the power supply board a new DC input lead. Attach to rightmost pin of the 3 pins previously unsoldered. You can verify the pin as it wires directly to the power diode under the black varistor on the right side near the varistor. The other side of the diode goes to the voltage regulator, leftmost pin; center pin, ground; right pin, regulated DC output. DC input can be anything from +15 volts to +24 volts DC; I recommend +12 VDC. Check for shorts, and when ready, apply power and test as 10 GHz amplifier. Now it's an LNA and not any longer an LNB.

Now, the last question: Why remove the waveguide input and convert to SMA connection? While it seems to be easier to use an SMA connector for the input, making them more desirable for conversion to existing systems, there remains a point to consider — that is, keeping them in original input circuitry (waveguide) and adapting them to the feedpoint of your dish using a waveguide switch for transmit/receive switching. The RF preamp is at the most desirable point in the system, with minimum loss from the antenna to the preamp input. A consideration for best receiver applications is to position the preamp as close to the antenna as possible. The loss from antenna to preamp input adds up to reduce the system noise figure in any system with a preamp. If your losses are 3 dB and your preamp has a 1 dB noise figure, the system noise figure will be 4 dB or slightly greater in this simple example.

If you have to be SMA input, use a WR-75 SMA transition to waveguide for the interface or do some machine shop modifications to bring out the inner lip of the waveguide. Replace the probe with an SMA connector and 1 pF chip cap for isolation and give it a try. I haven't done this, as I don't have anything more than my vertical mill, a drill press.

I hope this gives you some confidence to try out these many different models of LNB in the surplus market, as they should be in abundance at inexpensive prices. If you can't find any to convert, I will supply either the black or large beige LNB described, tested good, for $20 each postpaid US. Canadian destinations, please inquire. Best 73, Chuck WB6IGP. For questions about this and other applications, E-mail me at [clhough@pacbell.net]. 73

## QRP Antenna Showdown

*continued from page 13*

the quietest antenna of the bunch. Eliminating the noise floor allows weak signals to almost jump right out at you, giving the illusion of some sort of gain factor. The super loop is somewhat fragile; a sharp jolt can break the capacitor's rotor away from its stator assembly. I know, it happened to me. Although not very portable, this antenna works well on travel trailers and cabin installations.

As with the Miracle Whip, the ATX/MFJ 1899 also provides wide frequency coverage. The multiple loading coil taps allow for very fast frequency changes in the field anywhere from 80 meters up through the UHF bands.

The MM-20 was the only antenna that included a built-in mount making it self-supporting. The MM-20 is not much of a shortened antenna, as it is a full 1/4 wavelength vertical on several bands and on others it requires very little use of the loading coil. If needed, the large, 2-inch high-Q coil needs only to be tapped a couple of turns to

obtain resonance. Three sets of full-size tuned radials for each band are provided with the antenna.

The Maldol monobander antenna is the simplest, smallest, and least frilled of all the antennas I used. Several have experimented using two of these as a rotatable dipole, with some real success. 73

## Now Hear This!

*continued from page 19*

diaphragm touching the nail head. This is easier than you may think. A piece of cork gasket material was cut to fit on the piece of wood with the protruding nail head. Before gluing in place check the clearance with the magnet attached. It may be necessary to file down the nail head a little more to gain clearance. A few finishing touches: (1) Glue a piece of circuit board to the back and solder the #32 wire leads. (2) Fabricate a covering for the diaphragm from wood or aluminum with a 1/2" hole in the middle; make a spacer of thin cardboard (approximate thickness of two index cards) to go between the covering and the diaphragm edges: secure with screws in the four corners. Congratulations! Your home-brew magnetic headphone is complete. Have fun!

**Performance**

Although it cannot compete with the best magnetic headphones that exist, it performs well. The strongest local AM stations can easily be heard, and sometimes on a good night more distant ones can be heard, too.

**Parts sources**

Hosfelt Electronics, Inc.
2700 Sunset Blvd.
Steubenville, OH 43952
1-800-524-6464

All Electronics Corporation
905 S. Vermont Avenue
Los Angeles, CA 90006
1-800-826-5432 73

**Say You Saw It in *73!***

## Yes, I Built Sixteen Log Periodic Antennas!

*continued from page 27*

This one is only suited for the higher bands due to the rear mast height. The vertical DLP will usually have a lower angle of radiation than an equivalent horizontal DLP. It will generally not be too good for short-haul on 20m or 15m, but might be better on longer, multihop circuits. The one tested here worked extremely well on 10m.

Being vertically polarized, it is more subject to man-made QRM. This type is only suggested as a space saver or possibly for mounting on the roof of a building where length may be available but with insufficient width for a four-mast horizontal DLP.

**Fig. 8** illustrates a single band vertical monopole LP using ground radials suited for a 40m or 80m beam.

The advantage of the monopole is that only a single high rear mast is required (which might be the tower for a rotary beam), plus a shorter wood pole for the forward mast. As the vertical radiating elements are only 1/4λ, the rear mast can be approximately one half that required for a vertical DLP, **Fig. 7**, for the same frequency. A rear mast height (for **Fig. 8**) of 15.24m (50') is required for 40m; 22.87m (75') for 3.8–4.0 MHz; or 24.39m (80') for 3.5–4.0 MHz.

The disadvantage is that at least 30% more antenna wire is required for the monopole LP using ground radials, compared with a DLP.

A vertical beam of this type should have an open area in the direction of the beam. Aiming toward a hill, heavy wooded area, etc., should be avoided due to its low angle of radiation. From the tests made here, a two- or three-story dwelling in the beam's path seems to give about 5 dB attenuation. No doubt the plumbing, electrical wiring, or air conditioning ducts either resonate or give sufficient screening to cause this attenuation. It is therefore suggested that vertical beams be used only on open terrain having good ground conductivity. Avoid trees or other obstacles in the path of the beam.

The ideal location for a vertical beam of this type would be at a coastal area as near the shore line as possible, with the beam aimed seaward toward a DX continent. Those lucky enough to have such a location would no doubt have excellent results with a monopole LP having a 10 dB gain on 40m or 80m. One aimed across a lake might also be good.

A vertical monopole for both 40m and 80m of the "skip band" type is not out of reason, but would require at least 45.73m (150') in length by 42.68m (140') or 6,042.44m$^2$ (21,000 sq. feet) of open space, which is quite an area unless you are lucky enough to live on a ranch or farm.

Next time, we'll get into the step-by-step procedure for assembling simple, inexpensive 2:1 bandwidth DLPs for 20-15-10m, single band LPs for 40m or 20m, and 40m or 80m vertical monopoles. 73

## Calendar Events

*continued from page 41*

Television Society will hold its BRATS Maryland Hamfest and Computer Fest on Sunday, July 27th, at the Timonium Fairgrounds, York Rd. off I-695, I-83. Directions: Take I-695 (the Baltimore Beltway) to Exit 24 (I-83 North). From I-83, take Exit 17 (Padonia Rd. East), then turn right at the 3rd traffic light onto York Rd. Continue south on York Rd. to the Fairgrounds entrance. You can also take the MTA Light Rail to the Timonium Park & Ride stop, or park in the Timonium Park & Ride lot on Deereco Rd. Talk-in on the 147.03(+), 145.13(+), 224.96 and 448.325 MHz rptrs. Grounds open for tailgating at 6 a.m. Building opens at 8 a.m. Accessible to the handicapped. Vendors can setup beginning at 2 p.m. on Saturday. Admission is $6 per adult, children under 12 free. Tailgating spaces are $10 each, first come, first served. No advance reservations for tailgating spaces. VE exams will be given at 9 a.m. only; check-in is at 8:30. Pre-registration is required. To pre-register call *John Creel WB3GXW* at *301-572-5124*, after 6 p.m. For further info see the Web page at *[http://www.bratsatv.org]*; E-mail *[hamfest@bratsatv.org]*; call or fax *410-461-0086;* or write *BRATS Hamfest, P.O. Box 5915, Baltimore MD 21282-5915.*

**AUG 2**

**ALFARATA, PA** Juniata Valley ARC Hamfest, 6:30 a.m. General admission, 8:00 a.m. Morning and noon food items available.

*Continued on page 61*

# PROPAGATION

Jim Gray II
210 E. Chateau Cir.
Payson AZ 85541
[akdhc2pilot@yahoo.com]

# MUFs, LUFs, and SIDs

*Solar activity will range from quiet to active in June but no major geomagnetic storms are expected. Aside from seasonal limitations, propagation throughout the first half of the month should provide some excellent DX opportunities.*

The first five days should be especially good, although coronal hole effects may tend to dim this outlook somewhat. Only three days out of the first two weeks are forecast to be duds. In contrast, generally fair to poor conditions will prevail during the second half of June, although the 19th–20th and 29th–30th have the potential to be the best propagation days of the month. The worst period will be from the 22nd through 28th, with the greatest solar activity occurring on the 24th, 25th, and 26th.

We are now in the summer "doldrums," where strong ionization puts a damper on daytime HF communications, so this is a good time to review the concept of Maximum and Lowest Usable Frequencies (MUFs and LUFs) and how they affect us. The MUF is the highest frequency that can be adequately reflected back to Earth and the LUF is the minimum frequency that can overcome atmospheric attenuation. The MUF for a given distance is basically controlled by the angle of reflection (determined by the condition and height of the "F" layers of the ionosphere), while the LUF is determined by the amount of attenuation caused by the "D" layer. As the frequency is reduced, the losses from the "D" layer increase, and at some point the signal becomes lost in the background "noise." Since "D" layer absorption is at its greatest during the summer, LUFs rise to their highest values of the year. When the LUF is equal to or greater than the MUF, there is a "blackout" and communications become very difficult, if not impossible, to maintain. Sudden Ionospheric Disturbances (SIDs) due to solar flares add significantly to "D" layer absorption and often trigger such blackouts.

How do we work around these problems? The most obvious is to operate during the early and late parts of the day, at night,

**June 2003**

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| 1 G | 2 G | 3 G | 4 G | 5 F-G | 6 F | 7 G |
| 8 F-G | 9 F-P | 10 F-P | 11 F-P | 12 G | 13 G | 14 F-G |
| 15 F | 16 F | 17 F-P | 18 F | 19 VG | 20 G | 21 F-G |
| 22 F-P | 23 F-P | 24 P | 25 P | 26 P | 27 F-P | 28 F-P |
| 29 G | 30 VG | | | | | |

**EASTERN UNITED STATES TO:**

| GMT: | 00 | 02 | 04 | 06 | 08 | 10 | 12 | 14 | 16 | 18 | 20 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Central America | 15-20 | (15-40) | 20 (40) | 20 (40) | (20) | (20) | (15) 20 | 15 (20) | 15 (20) | 15 (20) | 10-20 | (12) 20 |
| South America | 15-20 | (15) | (15) 20 | (20-30) | x | (20) | (15-20) | (15) | (15) | (10-15) | 10 (20) | (10) 20 |
| Western Europe | 20 (40) | 20-40 | (20-40) | (20-40) | 20 | (20) | (15-17) | (15) | x | (15-20) | (15) 20 | (17) 20 |
| Southern Africa | (40) | (40) | 20 | 20 | x | x | x | (12) 15 | (15) | (20) | (20) | x |
| Eastern Europe | 20 (30) | 20 (40) | (20-30) | x | x | x | x | x | x | (15-20) | (12) 20 | (17) 20 |
| Middle East | 20 (40) | 20 (40) | (20-30) | x | x | (20) | x | x | (15) | (15-20) | 15-20 | (15) 20 |
| India/ Pakistan | (15-20) | (20) | x | x | (20) | x | x | x | x | x | x | (15) |
| Far East/ Japan | x | x | x | x | x | (20) | (20) | x | x | x | x | (15) |
| Southeast Asia | (15-20) | x | (20) | x | x | (20) | x | x | x | x | x | (15-20) |
| Australia | 15 | (15) | 15 (20) | 20 (30) | (20-40) | (20) | (17) 20 | (20) | x | x | x | (15) |
| Alaska | (15) | (20) | (20) | (20) | (20) | (20) | (20) | x | x | x | (15) | (15) |
| Hawaii | 15 (20) | (15) 20 | 20 (30) | 20 (30) | 20 (30) | (20-30) | (20) | x | x | x | (15) | (10-15) |
| Western USA | (12) 20 | (12) 40 | (20) 40 | (30) 40 | (30) 40 | (30) 40 | (40) | x | (17) 20 | (12) 20 | (10) 20 | (10) 20 |

**CENTRAL UNITED STATES TO:**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Central America | 15-20 | (15) 20 | 20 (40) | 20 (40) | (20) | 20 (40) | 20 | (15) 20 | 15 (20) | (10-20) | 10 (20) | (10) 20 |
| South America | 10- 20 | (12) 20 | (15-40) | (20-40) | x | (20) | (20) | (15) | x | (10-12) | (10-15) | 10 (20) |
| Western Europe | (17) 20 | 20 (30) | 20 (40) | (40) | x | (20) | (20) | x | x | x | x | (15) 20 |
| Southern Africa | x | x | (30-40) | (20) | x | x | x | (15) | (15) | (20) | (20) | x |
| Eastern Europe | 20 | 20 (40) | (20-30) | (20) | x | (20) | (20) | x | x | (15) | (15-20) | (20) |
| Middle East | (17) 20 | 20 (40) | (20-30) | x | x | x | (20) | x | x | x | (15) | (15-20) |
| India/ Pakistan | (15-20) | (15-20) | (20) | (20) | (20) | (20) | (20) | x | x | x | x | x |
| Far East/ Japan | (15) | (15) | (15) | x | (20) | (20-40) | 20 (30) | (17) 20 | (20) | x | x | x |
| Southeast Asia | (15) | (15) | (20) | (20) | (20) | (20) | (20) | (20) | x | x | x | x |
| Australia | (15) | 15 | (15-20) | 20 (30) | 20 (40) | (20-40) | 20 (40) | 20 | x | x | (15) | x |
| Alaska | (15-17) | 15 (17) | (15) 17 | (20) | (20-30) | (20-40) | 20 (30) | (20) | x | x | (15) | x |
| Hawaii | (10-20) | 15 (20) | (15) 20 | 20 | 20 (40) | (20-40) | 20 (30) | (20) | x | x | (15) | x |

**WESTERN UNITED STATES TO:**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Central America | (12) 20 | (15) 20 | 20 (30) | 20 (40) | (20-30) | (20-40) | (20-30) | 20 | (15-20) | (10-17) | (10-17) | (10-20) |
| South America | 12 (20) | (12) 20 | (15) 20 | (17) 20 | (20-40) | (20) | (20-30) | (15-20) | x | x | (10-15) | (10-15) |
| Western Europe | (17) 20 | 20 | 20 | (20) | x | x | x | (20) | (15-17) | (15) | x | (15-17) |
| Southern Africa | x | x | x | (20) | (20) | x | x | (20) | (17-20) | (15-17) | x | x |
| Eastern Europe | x | x | 20 (30) | (20) | x | x | x | x | x | x | x | x |
| Middle East | (20) | (20) | (17) 20 | (20) | x | x | x | x | x | (15) | x | x |
| India/ Pakistan | x | x | (15) | x | x | x | (20) | (20) | (20) | (15-17) | x | x |
| Far East/ Japan | (15) | x | (20) | (17) 20 | 20 | 20 (40) | (20-40) | 20 (30) | (17) 20 | (15-20) | x | 15 |
| Southeast Asia | x | x | (15) | x | (20) | (20-30) | (20-30) | 20 (30) | (17) 20 | (17-20) | x | x |
| Australia | (10-15) | (10) 15 | (12) 15 | (15-20) | 20 | 20 (40) | 20-40 | (17) 20 | (17) 20 | x | x | (12-15) |
| Alaska | (12-15) | (12-15) | (15-20) | (17-20) | 20 (30) | (20-30) | (20-40) | 20 (30) | (20) | (17) | x | (15) |
| Hawaii | (10-15) | (10) 15 | (12) 15 | (15-20) | 20-40 | (20) 40 | (20) 40 | 20 (30) | (20) | x | x | (15) |
| Eastern USA | (12) 20 | (12) 40 | (20) 40 | (30) 40 | (30) 40 | (30) 40 | (40) | x | (17) 20 | (12) 20 | (10) 20 | (10) 20 |

***Table 1.*** *Band, time, country chart. Plain numerals indicate bands which should be workable on Fair to Good (F-G) and Good (G) days. Numbers in parentheses indicate bands usually workable on Good (G) days only. Dual numbers indicate that the intervening bands should also be usable. When one number appears in parentheses, that end of the range will probably be open on Good (G) days only.*

and on the highest frequencies possible. Morning and evening gray-line propagation can be very effective if you are able to reach areas of the world that interest you. If you have the power to increase gain by 10 dB for each 2 MHz reduction in frequency, you can often operate below the LUF. Sporadic-E (touched upon last month) can be another interesting avenue of investigation if you have the time and patience to watch for it. Finally, propagation analysis programs are indispensable tools for determining MUF/LUF values for a particular circuit. "MINIMUF," "MICROMUF," "WINCAP," "VOACAP," and "CAPMAN" are a few of the popularly used titles. NB6Z maintains a Web site with links to many useful on-line propagation tools. See [http://home.teleport.com/~nb6z/solar.htm].

73 and happy hunting!

### Band-by-Band Forecast

**10–12 meters.** Openings on ten and twelve are limited. but there should still be regular opportunities into the Caribbean and Latin or South America from mid-afternoon through early evening. Eastern Europe and the Middle East might open up just after sunrise, and Japan, Australia, or the Far East may be open in the early evening. Daytime short-skip can range from 1,000 to about 2,000 miles.

**15–17 meters.** Some good opportunities can still be found in many areas of the world, but these will diminish as the month progresses. Openings will begin about an hour after sunrise and should last until nearly midnight. Central and South America will be quite reliable for a good part of the day while the western Pacific, from the Aleutians down to Australia, should supply regular openings around mid-evening. Short-skip will average between 1,000 and 2,000 miles.

**20 meters.** Around-the-clock opportunities will be available on Good (G) days. Decent opportunities will often be found right after sunrise and late in the afternoon, but the evening hours after sunset will be the best time for strong propagation. Suppertime through late evening should support regular pipelines to Europe and the Middle East, but you'll only find "night owls" awake over there at those hours. If you find yourself awake between midnight and sunrise, try working the central or western Pacific, where openings should be regular and strong. Short-skip will fluctuate between 500 and 2,200 miles.

**30–40 meters.** Atmospheric noise due to convective storms will play the major role in daily conditions, but there should be lots of activity here during the quieter periods. Good opportunities to Europe, the Middle East, and Africa will be available to stations located in the eastern U.S., while Australia, Japan, and the Far East will be open to those in the western states. If you live in the central U.S., then all of these regions should be available to you at some time during the month. As usual, Central and South America and the Caribbean will be open to everyone on most days. Short-skip at night will range from 500 to 2,500 miles but will be well under 1,000 miles during the day.

**80–160 meters.** Propagation on these bands will be spotty due to high QRN levels, but decent opportunities can still be found at night during the quieter periods. Let forty meters be your guide. Eighty and 160-sixty are pretty much nighttime-only bands with short-skip ranging from 1,000 to 2,000 miles, but daytime multiskip is possible into the Caribbean and northern South America. Noise levels are bound to be very high on most days, however, and daytime short-skip will typically fall under 300 miles. 73

## Calendar Events

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Admission $2.00 donation, XYL and children free. Tailgating $5.00 donation, includes admission. Indoor tables, $10.00 donation per table. Space is limited. Vendors responsible to collect PA sales tax. Electricity, $2.00 additional. Please bring your own power cords. Directions: The Decatur Fire Co. is located along US Route 522 North, 8 miles east of Lewistown, PA in the town of Alfarata, PA. Look for signs. Talk-in on 146.910 MHz. *For more info, contact JVARC, PO Box 73 Yeagertown PA 17099, or contact Cliff Bell WB3IVX, 717 248 2616.*

**SEP 25–28**

**SEATTLE WA** Microwave Update 2003 organizers and the Pacific Northwest VHF Society are joining forces to host a joint conference in the Seattle WA area on September 25–28, 2003. Registrations for the joint conference will be accepted beginning April 1st. Cost of the registration will be $40 prior to September 12th, and covers all three days. Single day or single event registrations are not available. Late registrations, including at the door, will be $50. Registration forms can be downloaded at *[www.microwaveupdate.org]* or send an SASE to *John Price N7MWV, 12026 81st Ave. NE, Kirkland WA 98034,* and a form will be mailed to you. Completed registration forms and payment should be sent to the same address. Make checks payable to *Microwave Update 2003.* Joint conference sessions and the Saturday evening banquet will be held at the Everett Holiday Inn and Conference Center, a short drive north of downtown Seattle. Special rates have been arranged with the hotel for conference participants. Rooms are $69 per night plus tax, a real bargain for the Seattle area! It is suggested that early reservations be made directly with the hotel at *425-337-2900.* Be sure to mention "Microwave Update" to get this rate. Reservations must be made by August 21st for this rate.

"White papers" are currently being solicited from potential authors and speakers for publication in the 2003 conference proceedings. Topics specifically of interest to Microwave Update attendees, as well as those on VHF and UHF subjects usually associated with the annual Pacific Northwest VHF Conference are being solicited. Papers will be accepted until July 1st, 2003, to allow enough time for printing. White papers should be sent directly to *Jim Christiansen K7ND,* via E-mail at *[k7nd@att.net].* MS Word format is preferred. Microwave Update 2003 and the Pacific Northwest VHF Society respectively, will be the sole judges of whether presentation requests and white papers are accepted.

If you are interested in making a session presentation at one of the Microwave Update 2003 sessions, please respond to *NU7Z [nu7z@aol.com].* For presentations at the Pacific Northwest VHF Conference sessions, contact *N7CFO* at *[n7cfo@ix.netcom.com].* LCD projection equipment will be available for those using PowerPoint presentations. Slides and video presentations can be accommodated with advance notice. 73

## The Digital Port

*continued from page 44*

good) check out the 1st Page 2000. Very satisfactory for just about any purpose I can imagine. It is available for download from [www.evrsoft.com/].

That's it for this month. I need to stop and get my digital operating "fix." See you out there. 73, Jack KB7NO [KB7NO@att.net]. 73

## Homing In

*continued from page 55*

will be up to $1,200 for units with built-in GPS and as low as $500 for non-GPS units. NOAA knows that more beacons mean more false alarms, but the requirement for 406 MHz digital ID will at least tell them who's transmitting, making it easier and faster to deal with them. NOAA

is so confident about this that plans are in the works to discontinue satellite tracking of anonymous 121.5 MHz alerts by 2009.

Do these new rules mean more opportunities for search and rescue support by hams? Only time will tell. Meanwhile, I want to hear about your experiences in searches for ELTs, EPIRBs, and PLBs. Send stories and photos via the Internet or the Post Office to the addresses at the beginning of this article.

### Notes

1. "Homing In: Wildlife Tracking Update — Burrowing Owls Found, Saw-whets Sought," *73 Magazine*, October 2001.

2. "Homing In: Squegging — Now It Helps Us Track the Birds," *73 Magazine*, January 2003.

3. [www.batcon.org].

4. "Homing In: Two New Tools for T-Hunting," *73 Magazine*, April 2003.

5. Moell and Curlee, *Transmitter Hunting — Radio Direction Finding Simplified*, published by TAB McGraw-Hill, ISBN 0-8306-2701-4. Chapter 23 has a detailed description of SARSAT/COSPAS technology.

6. "Homing In: T-Hunters to the Rescue," *73 Magazine*, April 1994. 73

## LETTERS

*continued from page 9*

complex each week. My wife plays the lessons at the same time each day, and the baby gives her reminder kicks about half an hour before each lesson.

We'd never have done these things without you. My former-vegetarian wife is even eating salmon to increase her DHA levels, thanks to Uncle Wayne. Oh, and the baby gets a literal kick out of Mozart's last four symphonies. Your recommended CD guide is astonishingly good! We can't wait to apply the lessons we're learning from Baby Signs and Joan Beck's book … and then come the music lessons, foreign language immersion, speed reading. … I think our kids are going to be enormously grateful to you! 73

## NEVER SAY DIE

*continued from page 33*

### Coach-Class Syndrome

In a past editorial, I wrote about how Continental Airlines almost killed me on a trip to Lisbon. The June 27th issue of the *Wall Street Journal* had a front page article on what they've termed the Coach-Class Syndrome. Some of the airlines are beginning to warn passengers about this problem.

When I arrived in Lisbon, after a couple hours of uncomfortable sleep, jammed into the coach-class seat with almost no leg room, my right leg was totally numb, except for a whole lot of pain. The sharp front edge of the seat cushion had cut off the blood circulation to the leg and a blood clot had formed. It took two days of great pain before I was able to hobble around, totally ruining my visit to Lisbon.

I was lucky. It took the death of Emma Christofferson, returning to London from Australia, to get the attention of the media. Emma, 28, was an active skier and in perfect health. A blood clot had formed in one leg and gone to her heart. Blotto.

A medical journal on the subject said that over 800,000 airline passengers have had to be hospitalized for this deep-vein thrombosis (DVT) after long flights. I really should have opted for a hospital, but I didn't know any better. Some aspirin could have helped thin my blood, returning circulation faster.

Now some of the airlines are warning passengers to get up and move around the cabin every hour, to drink plenty of liquids, and avoid any alcoholic or caffeinated drinks, since they dehydrate you. The very dry air in planes makes dehydration a particular problem.

Hey, guys, how about changing your seat design?

### Still Another Poison

Yep, something more to worry about. It's no wonder, according to the AMA, that only 1.6% of Americans are truly healthy. It's plastics (again). That clear plastic wrap we use for foods, it turns out, outgases into the wrapped food, and from there into us. The really bad news is that the toxic chemicals involved look to our bodies like estrogen, and elevated estrogen levels create a whole raft of troubles — like prostate, breast cancers, and uterine fibroid tumors.

No, you don't want to substitute aluminum foil. How about going back to waxed paper?

Unlike our grandparents, we're being bombarded with estrogen in our eggs, milk, cheese, butter, yogurt, meat and poultry. They're all laced with trace amounts as a result of the steroids pumped into young cows and poultry via their feed or injections to fatten them up so they'll be better egg layers, milk or meat producers. Organic meat, dairy, and poultry don't have these toxins, if you can find 'em. Since reading Robert Cohen's *Milk, The Deadly Poison*, I've stopped drinking milk. I'm still using butter and yogurt, but you can be sure that I'm only buying the packages with the "organic" label. I want as much of the food I eat as possible not laced with pesticides, growth hormones, estrogen, and antibiotics.

### The Fiend

When I was a kid anyone who was into photography was a "camera fiend." Hams were "radio fiends." The fiend term dropped out of use, replaced by "nut," as in camera nut or radio nut. So I've graduated from being a fiend to a nut.

The terms were applied to anyone who was seriously into anything — anyone who is different. Golf nuts, sports car nuts, crossword puzzle nuts, health nuts, and so on.

Having been an only child, I was brought up by and with adults, so I never got the hang of this kid peer-pressure thing. Still haven't. When I got to my teens and the other kids were smoking I tried it and said yuuuck. That was before the big health brou-ha-ha over cigarettes. My father smoked, and so did everyone else in my family.

When I dutifully went off to college (I didn't know any better then) and joined a fraternity, beer drinking was the big deal. They had weekend parties where my fraternity brothers would drink beer until they puked, and then drink more. I tried beer. Ugh. Phooey, again. And this despite everyone in my family drinking. Heck, during Prohibition my dad had a bar in the cellar where he entertained his aviator friends — like Amelia Earhart. Everyone in those days smoked and drank. But me. I wasn't righteous about it. I wasn't worried about my health, I just didn't like the taste, case closed.

I'm still marching to my own drum, and the hell with peer pressure.

And this holds for my essays, too. I'm no more swayed by the general public's CW (Conventional Wisdom) than I am the CW fiends in Newington who have almost killed our beloved hobby. As I've been saying in my editorials for the last 50 years, I do my homework carefully before I write — but, if you have data that I haven't found that has led you to another conclusion, please let me know what I've missed. I've insisted that it be information, not an emotional belief that you want me to share.

This attitude has naturally alienated a lot of readers — because I've researched and written about many controversial

*Continued on page 64*

# Wise Up!

**Here are some of my books which can change your life (if you'll let 'em). If the idea of being healthy, wealthy and wise interests you, start reading. Yes, you can be all that, but only when you know the secrets which I've spent a lifetime uncovering.**

.....Wayne

**The Secret Guide to Health**: Yes, there really is a secret to regaining your health and adding 30 to 60 years of healthy living to your life. The answer is simple, but it means making some serious lifestyle changes. Will you be skiing the slopes of Aspen with me when you're 90 or doddering around a nursing home? Or pushing up daisies? No, I'm not selling any health products, but I can help you cure yourself of cancer, heart trouble, or any other illness. Get this new, 2002 expanded edition (160p). $10 (#04)

**The Secret Guide to Wealth**: Just as with health, you'll find that you have been suckered by "the system" into a pattern of life that will keep you from ever making much money and having the freedom to travel and do what you want. I explain how anyone can get a dream job with no college, no résumé, and even without any experience. I explain how you can get someone to happily pay you to learn what you need to know to start your own business. $5 (#03)

**The Secret Guide to Wisdom**: This is a review of around a hundred books that will boggle your mind and help you change your life. No, I don't sell these books. They're on a wide range of subjects and will help to make you a very interesting person. Wait'll you see some of the gems you've missed reading. You'll have plenty of fascinating stuff to talk about on the air. $5 (#02)

**My WWII Submarine Adventures**: Yes, I spent from 1943-1945 on a submarine, right in the middle of the war with Japan. We almost got sunk several times, and twice I was in the right place at the right time to save the boat. What's it really like to be depth charged? And what's the daily life aboard a submarine like? How about the Amelia Earhart inside story?If you're near Mobile, please visit the Drum. $5 (#10)

**Travel Diaries**: You can travel amazingly inexpensively – once you know the ropes. Enjoy Sherry and my budget visits to Europe, Russia, and a bunch of other interesting places. How about a first class flight to Munich, a rented Audi, driving to visit Vienna, Krakow in Poland (and the famous salt mines), Prague, back to Munich, and the first class flight home for two, all for under $1,000? Yes, when you know how you can travel inexpensively, and still stay in first class hotels. $5 (#11)

**Writer's Guide:** It's easy, fun, can pad your résumé, and impress the hell out of your friends. $0 (#78)

**Wayne's Caribbean Adventures**: My super budget travel stories – where I visit the hams and scuba dive most of the islands of the Caribbean. You'll love the special Liat fare which let me visit 11 countries in 21 days, diving all but one of the islands, Guadeloupe, where the hams kept me too busy with parties. $5 (#12)

**Cold Fusion Overview**: This is both a brief history of cold fusion, which I predict will be one of the largest industries in the world in the 21st century, plus a simple explanation of how and why it works. This new field is going to generate a whole new bunch of billionaires, just as the personal computer industry did. $5 (#20)

**Improving State Government**: Here are 24 ways that state governments can cut expenses enormously, while providing far better service. I explain how any government bureau or department can cut its expenses by at least 50% in three years and do it cooperatively and enthusiastically. I explain how, by applying a new technology, the state can make it possible to provide all needed services without having to levy *any* taxes at all! Read the book, run for your legislature, and let's get busy making this country work like its founders wanted it to. Don't leave this for "someone else" to do. $5 (#30)

**Mankind's Extinction Predictions**: If any one of the experts who have written books predicting a soon-to-come catastrophe which will virtually wipe most of us out are right, we're in trouble. In this book I explain about the various disaster scenarios, like that of Nostradamus, who says the poles will soon shift (as they have several times in the past), wiping out 97% of mankind. Okay, so he's made a long string of past lucky guesses. The worst part of these predictions is the accuracy record of some of the experts. Will it be a pole shift, a new ice age, a massive solar flare, a comet or asteroid, a bioterrorist attack? I'm getting ready, how about you? $5 (#31)

**Moondoggle**: After reading René's book, *NASA Mooned America*, I read everything I could find on our Moon landings. I watched the NASA videos, looked carefully at the photos, read the astronaut's biographies, and talked with some readers who worked for NASA. This book cites 45 good reasons I believe the whole Apollo program had to have been faked. $5 (#32)

**Classical Music Guide**: A list of 100 CDs which will provide you with an outstanding collection of the finest classical music ever written. This is what you need to help you reduce stress. Classical music also raises youngsters' IQs, helps plants grow faster, and will make you healthier. Just wait'll you hear some of Gotschalk's fabulous music! $5 (#33)

**The Radar Coverup**: Is police radar dangerous? Ross Adey K6UI, a world authority, confirms the dangers of radio and magnetic fields, including our HTs and cell phones. $3 (#34)

**Three Gatto Talks**: A prize-winning teacher explains what's wrong with American schools and why our kids are not being educated. Why are Swedish youngsters, who start school at 7 years of age, leaving our kids in the dust? Our kids are intentionally being dumbed down by our school system — the least effective and most expensive in the world. $5 (#35)

**Aspartame:** a.k.a. NutraSweet, the stuff in diet drinks, etc., can cause all kinds of serious health problems. Multiple sclerosis, for one. Read all about it, two pamphlets for a buck. (#38)

**$1 Million Sales Video**: The secret of how you can generate an extra million dollars in sales just by using PR. This will be one of the best investments you or your business will ever make. $40 (#52)

**Reprints of My Editorials from *73*.** Very few things in this world are as we've been taught, and as they appear. As an iconoclast I blow the whistle on the scams around us, such as the health care, our school system, our money, the drug war, a college education, sugar, the food giants, our unhealthy food, fluorides, EMFs, NutraSweet, etc.

**1996 100 Editorial Essays:** $5 (#72)
**1997 157 Editorial Essays:** $8 (#74)
**1998 192 Editorial Essays:** $10 (#75)
**1999 165 Editorial Essays:** $8 (#76)
**2000 101 Editorial Essays:** $5 (#77)
**2001 104 Editorial Essays:** $5 (#78)

**Silver Wire**: With two 5-in. pieces of heavy pure silver wire + three 9V batteries you can make a thousand dollars worth of silver colloid. What do you do with it? It does what the antibiotics do, but germs can't adapt to it. Use it to get rid of germs on food, for skin fungus, warts, and even to drink, Read some books on the uses of silver colloid, it's like magic. $15 (#80)

**Colloid Reprint.** April 97 article on a silver colloid maker, history, and how to use the stuff. $5 (#98)

**Colloid Clips.** Three 9V battery clips, 2 alligator clips & instructions. $5 (#99)

**AC-powered Colloid Kit:**12V power supply, silver wires, reprint, including priority mail shipment. $37 (#82)

**Four Small Booklets Combo:** Super Organic Food: a trillion dollar new industry; Schools in 2020: another $ trillion industry. Anthrax, a simple cure. Dowsing: why and how it works. $3 (#86)

My 1992 **We The People Declare War! On Our Lousy Government** book—360 pages and packed with ideas that'll get you all excited. Was $13. While they last $10. Just a few left, found in the warehouse. Last chance for this classic.(#06)

**Stuff I didn't write, but you need:**

**NASA Mooned America**: René makes an air-tight case that NASA faked the Moon landings. This book will convince even you. $30 (#90)

**Last Skeptic of Science**: This is René's book where he debunks a bunch of accepted scientific beliefs – such as the ice ages, the Earth being a magnet, the Moon causing the tides, etc. $30 (#91)

**Dark Moon:** 568 pages of carefully researched proof that the Apollo Moon landings were a hoax—a capping blow for René's skeptics. $25 (#92)

**1982 General Class License Study Guides.** Teaches the fundamentals of radio & electricity. Was $7. I found a few in the warehouse. $3, while they last. Great book! (#83)

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The *73* Fiea Market, Barter 'n' Buy, costs you peanuts (almost) — comes to 35 cents a word for individual (noncommercial!) ads and $1.00 a word for commercial ads. Don't plan on telling a long story. Use abbreviations, cram it in. But be honest. There are plenty of hams who love to fix things, so if it doesn't work, say so.

Make your list, count the words, including your call, address and phone number. Include a check or your credit card number and expiration. If you're placing a commercial ad, include an additional phone number, separate from your ad.

This is a monthly magazine, not a daily newspaper, so figure a couple months before the action starts; then be prepared. If you get too many calls, you priced it low. If you don't get many calls, too high.

So get busy. Blow the dust off, check everything out, make sure it still works right and maybe you can help make a ham newcomer or retired old timer happy with that rig you're not using now. Or you might get busy on your computer and put together a list of small gear/parts to send to those interested?

**Send your ads and payment to: *73 Magazine*, Barter 'n' Buy, 70 Hancock Rd., Peterborough NH 03458 and get set for the phone calls.** The deadline for the August 2003 classified ad section is June 10, 2003.

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**K8CX HAM GALLERY** [http://hamgallery.com]. BNB620

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## NEVER SAY DIE

*continued from page 62*

subjects — subjects where belief systems are deeply indoctrinated.

When I write that things like dowsing, remote viewing, precognition, psychokinesis, past lives, and so on are real, it's much easier to slough me off as a nut than to do some reading to find out if I know what I'm talking about.

I've been writing about NASA faking the Moon landings. We saw and believed what we were seeing and being told. We all wanted so much to believe in America's great achievement that the voices of the few skeptics were drowned out. When René sent me a copy of his *NASA Mooned America,* which was obviously a self-published book, I laughed at the whole idea. I get a lot of conspiracy-theory books like that — full of speculation and short on reliable references. But René was citing facts and he had clear color NASA photos which, once I looked at them critically, backed up René. 73

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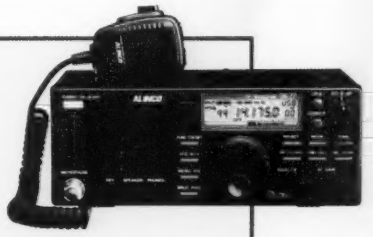

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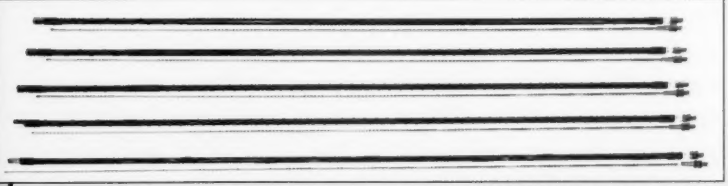

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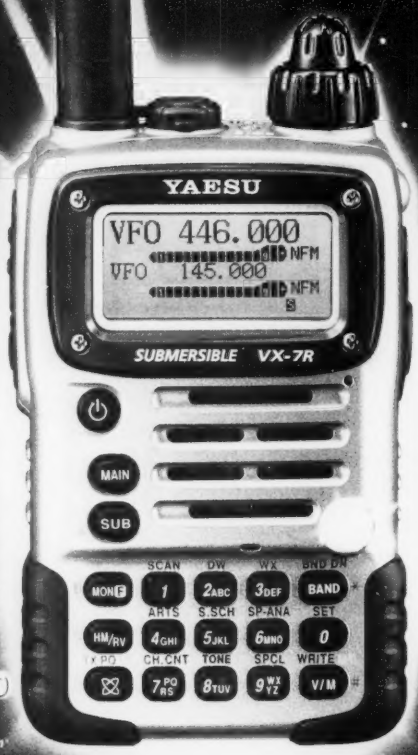


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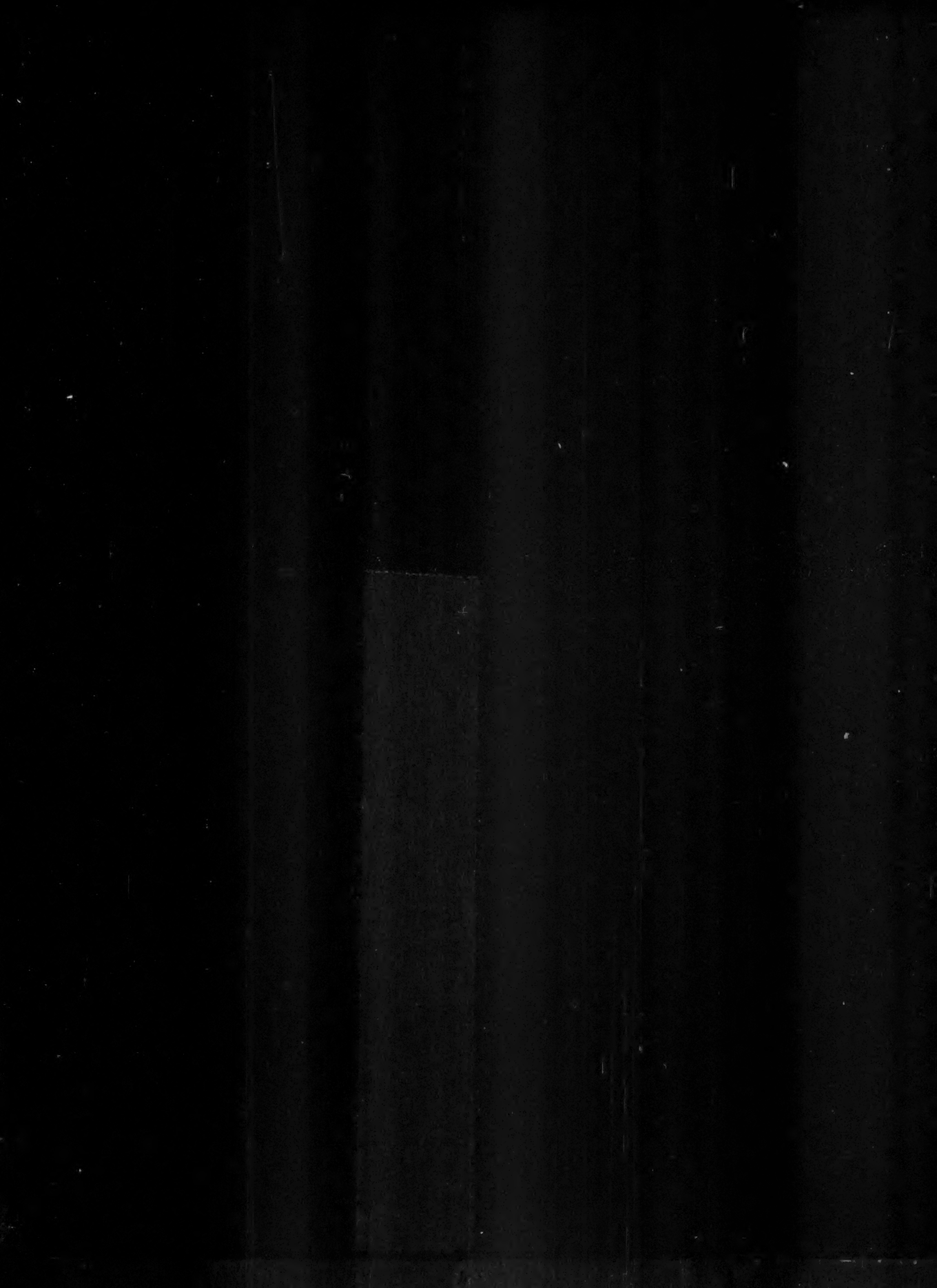
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